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## The AROC Annual Report: the state of rehabilitation in Australia in 2007

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### Abstract

This is the third comprehensive annual report describing discharge episodes from subacute inpatient rehabilitation programs provided by facilities that are members of the Australasian Rehabilitation Outcomes Centre (AROC). The inaugural report was published in April 2007 and described the 2005 data; this third instalment describes the 2007 data.

### Keywords

aroc, australia, rehabilitation, state, report, annual, 2007

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## 1 Introduction

This is the third comprehensive annual report describing discharge episodes from subacute inpatient rehabilitation programs provided by facilities that are members of the Australasian Rehabilitation Outcomes Centre (AROC)<sup>1</sup>. The inaugural report was published in April 2007 and described the 2005 data; this third instalment describes the 2007 data.

In July 2007 the version 3 AROC dataset was introduced and training in the new dataset was conducted around the country. The impact of this training was greater data quality, which in turn has seen some abrupt changes in some impairment categories.

The major differences between the version 2 and version 3 datasets are a change from the collection of living arrangements (who the patient lived with) pre and post episode, to the collection of level of support pre and post episode, and the addition of four new data items, a trauma indicator, the collection of complications that affected the rehabilitation program, date of establishment of a multidisciplinary team rehabilitation plan, and the date a discharge plan was made available. One of the impacts of these changes is that the version 3 dataset now contains all necessary data items to allow AROC members to collect and calculate their ACHS rehabilitation medicine clinical indicators.

As well as the changes described above, the version 3 dataset incorporates a revision of the impairment codes (reason for rehabilitation), which were revised during 2006 to more accurately reflect the Australian clinical environment.

On 1 July 2007 version 2 of the Australian National Sub-acute and Non-acute Patient (AN-SNAP) casemix classification<sup>2</sup> was implemented and this report classifies episodes utilising the revised classes. Figure 3 describes the differences between version 1 and version 2 AN-SNAP classes.

The aim of a rehabilitation service is to provide individuals experiencing a loss of function or ability resulting from injury or disease with the highest possible level of physical, psychological, social and economic independence. This is achieved through the combined and coordinated use of medical, nursing and allied health professional skills, and involves individual assessment, treatment, regular review, discharge planning, community integration and follow up of people referred to the service.

Therefore, the goal of rehabilitation is to promote functional independence so that the individual can return home and care for themselves instead of burdening an increasingly stretched social services and health care system. In Australia, an effective and efficient rehabilitation service is increasingly important in ensuring a continuum of care for an ageing population. The aim of the present report is to describe the state of rehabilitation in Australia in 2007 in terms of patient characteristics and rehabilitation outcomes, and document the major changes in rehabilitation that have occurred in recent years.

## 2 Rehabilitation in Australian – 2007

Across all impairment categories, the average age was 74.0 years, the majority of episodes of care (60.5%) were for female patients, and were provided by the private sector (64.3%). Figure 1

<sup>1</sup> Details on rehabilitation medicine and related definitions, the Australasian Rehabilitation Outcomes Centre (AROC) and the AROC data set are available in the inaugural report. Simmonds F, Stevermuer T. The AROC Annual Report: the state of rehabilitation in Australia 2005. Aust Health Rev 2007; 31 Suppl 1: s31-53. Available at:

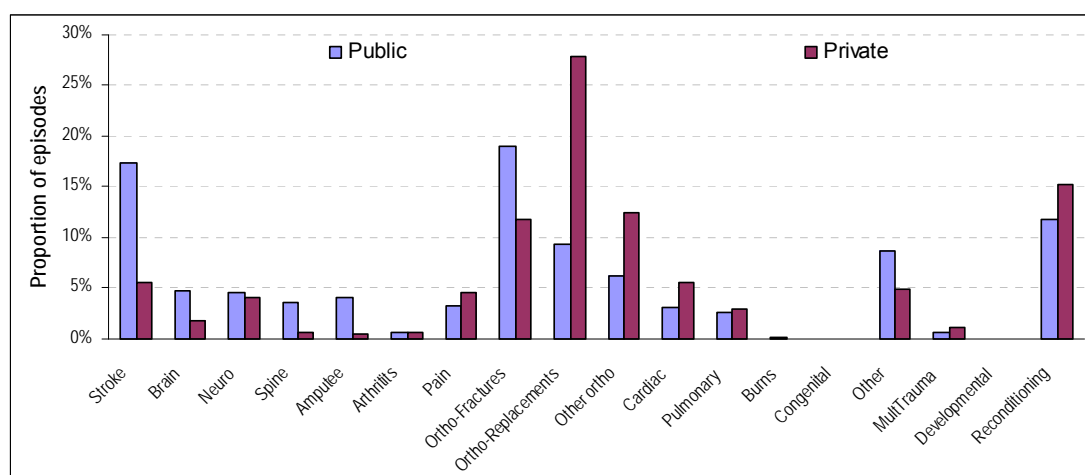
[http://www.aushealthreview.com.au/publications/articles/issues/ahr\\_31\\_1\\_0407/ahr\\_31\\_1\\_s031.asp](http://www.aushealthreview.com.au/publications/articles/issues/ahr_31_1_0407/ahr_31_1_s031.asp).

See also the Australasian Rehabilitation Outcomes Centre website: [chsd.uow.edu.au/aroc](http://chsd.uow.edu.au/aroc)

<sup>2</sup> Green J and Gordon R (2007) The development of Version 2 of the AN-SNAP casemix classification system. Australian Health Review. 31 (Supplement 1): S68-S78.

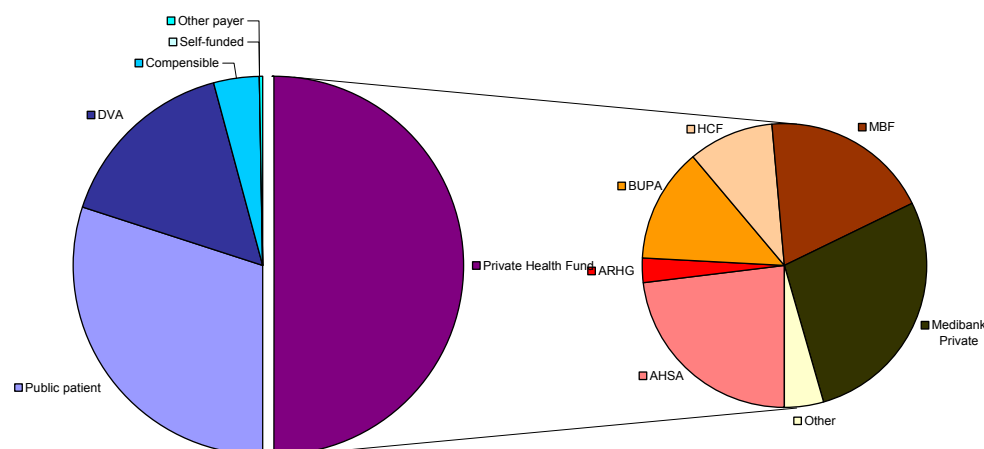
presents the 2007 data by AROC impairment group broken down into episodes provided by the private and public sectors. Orthopaedic rehabilitation is the largest type of rehabilitation in Australia, accounting for 51.5% of all private episodes and 32.6% of all public episodes. Orthopaedic rehabilitation is broken down into three categories, fractures, joint replacements and other, and these vary markedly by sector. The private sector provided more orthopaedic joint replacement episodes compared to the public sector (84.9% versus 15.1%), whilst the public sector provided more episodes for orthopaedic fracture rehabilitation (54.1% versus 45.9%). Overall the private sector provided the majority (74.0%) of orthopaedic episodes. Reconditioning was the second most common category accounting for 14.0% of all episodes, with the private sector providing the majority of episodes (71.1%). Stroke rehabilitation was the third largest category accounting for 9.8% of all episodes, with most episodes (63.0%) provided by the public sector.

**Figure 1** *Proportion of episodes by AROC impairment group and sector, 2007*



In Figure 2, the funding source for the 2007 data is described. Some 30% of episodes were funded by the public health system, 16% by the Department of Veterans' Affairs and 50% by the private health sector. Of those funded by the private health system, the pattern follows that of the market share of the major health funds, with Medibank Private funding the greatest percentage of the privately funded episodes. General, non-health insurers funded the remaining 4% of the episodes. Compared to 2006 there has been a small increase (3%) in the proportion of episodes funded by the private health sector and an equal decrease in the proportion funded by the public sector.

**Figure 2** *Funding sources for rehabilitation in Australia, 2007*





**Figure 3**      **Version 2 AN-SNAP classes for inpatient rehabilitation**

VERSION 1 AN-SNAP CLASSES		VERSION 2 AN-SNAP CLASSES	
201	Admit for assessment only	2-201	Admit for assessment only
202	Brain,Neuro,Spine & MMT,FIM 13	2-202	Brain,Neuro,Spine & MMT,FIM 13
203	All other impairments, FIM 13	2-203	All other impairments, FIM 13
204	Stroke and Burns,Mot 63-91,Cog 20-35	2-204	Stroke ,Mot 63-91,Cog 20-35
205	Stroke and Burns,Mot 63-91,Cog 5-19	2-205	Stroke ,Mot 63-91,Cog 5-19
206	Stroke and Burns, motor 47-62	2-206	Stroke, motor 47-62, cog 16-35
		2-207	Stroke, motor 47-62, cog 5-15
		2-208	Stroke, motor 47-62, cog 5-15
207	Stroke and Burns, Mot 14-46, Age>=75	2-209	Stroke, Mot 14-46, Age>=75
208	Stroke and Burns, Mot 14-46, Age<=74		Stroke, Mot 14-46, Age<=74
209	Brain Dysfunction, motor 71-91	2-210	Brain Dysfunction, motor 56-91, cog 32-35
		2-211	Brain Dysfunction, motor 56-91, cog 24-31
		2-212	Brain Dysfunction, motor 56-91, cog 20-23
		2-213	Brain Dysfunction, motor 56-91, cog 5-19
		2-214	Brain Dysfunction, motor 56-91, cog 5-19
210	Brain Dysfunction, mot 29-70, Age>=55	2-215	Brain Dysfunction, motor 24-55
211	Brain Dysfunction, mot 29-70, Age<=54		
212	Brain Dysfunction, motor 14-28		Brain Dysfunction, motor 14-23
213	Neurological, motor 74-91		Neurological, motor 63-91
214	Neurological, motor 41-73	2-216	Neurological, motor 49-62
215	Neurological, motor 14-40	2-217	Neurological, motor 18-48
		2-218	Neurological, motor 14-17
		2-219	Neurological, motor 14-17
216	Spnl Cord Dysfnc,Mot 81-91		Spnl Cord Dysfnc,Mot 81-91
217	Spnl Cord Dysfnc,Mot 47-80	2-220	Spnl Cord Dysfnc,Mot 47-80
218	Spnl Cord Dysfnc,Mot 14-46	2-221	Spnl Cord Dysfnc,Mot 14-46, Age>=33
		2-222	Spnl Cord Dysfnc,Mot 14-46, Age>=33
		2-223	Spnl Cord Dysfnc,Mot 14-46, Age<=32
219	Amp of limb,Mot 66-91	2-224	Amp of limb,Mot 72-91
220	Amp of limb,Mot 47-65	2-225	Amp of limb,Mot 14-71
221	Amp of limb,Mot 14-46		
222	Pain Syndromes	2-226	Pain Syndromes
223	Orthpaed Conds,Mot 74-91	2-227	Orthpaed Conds, Fractures, Mot 58-91
224	Orthpaed Conds,Mot 58-73	2-228	Orthpaed Conds, Fractures, Mot 48-57
225	Orthpaed Conds,Mot 52-57	2-229	Orthpaed Conds, Fractures, Mot 48-57
226	Orthpaed Conds,Mot 14-51	2-230	Orthpaed Conds, Fractures, Mot 14-47, Cog19-3
		2-231	Orthpaed Conds, Fractures, Mot 14-47, Cog 5-18
		2-232	Orthpaed Conds, Replcmnt, Mot 72-91
		2-233	Orthpaed Conds, Replcmnt, Mot 72-91
		2-234	Orthpaed Conds, Replcmnt, Mot 49-71
		2-235	Orthpaed Conds, Replcmnt, Mot 49-71
		2-236	Orthpaed Conds, Replcmnt, Mot 14-48
			Orthpaed Conds, Other, Mot 68-91
			Orthpaed Conds, Other, Mot 53-67
			Orthpaed Conds, Other, Mot 14-52
227	Cardiac	2-237	Cardiac
228	Major Multiple Trauma		Major Multiple Trauma, FIMtotal 101-126
		2-238	Major Multiple Trauma, FIMtotal 74-100, Burns Mot>13
		2-239	Major Multiple Trauma, FIMtotal 44-73
		2-240	Major Multiple Trauma, FIMtotal 44-73
		2-241	Major Multiple Trauma, FIMtotal 19-43
229	Oth Impairs,Mot 67-91	2-242	Oth Impairs,Mot 67-91
230	Oth Impairs,Mot 53-66	2-243	Oth Impairs,Mot 53-66

### 3 Outcomes by Impairment

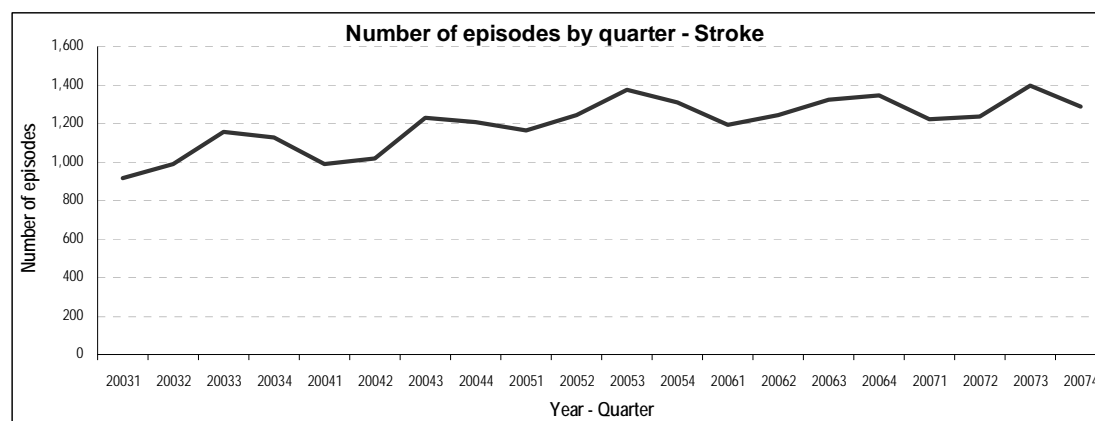
A series of figures and tables are provided for each impairment category; these outline the key descriptive data for 2007, changes in episode volumes between 2003 and 2007, and changes in rehabilitation outcome measures between 2006 and 2007. The first figure in each category outlines the number of episodes for each quarter over the past five years, and documents any changes in episode volume over time and/or seasonal trends. This is followed by a table outlining key 2007 data for the respective impairment category by version 2 of the AN-SNAP class. The third figure provides a summary of the discharge destination of all episodes by AN-SNAP class. The fourth figure provides a graphical representation of 2007 length of stay (LOS) and improvement in the functional independence measure (FIMTM – the FIM instrument, Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities Inc, State University of New York, Buffalo, NY, USA) by AN-SNAP class. Finally, the fifth figure presents the key changes in rehabilitation outcome measures between 2006 and 2007. The horizontal axis describes the difference between the 2006 and 2007 averages, while the actual 2006 data are presented on the left side of the graph. This figure now includes changes to discharge to community, previously not reported due to data quality concerns.

#### 3.1 Stroke

Figure 4A illustrates a consistent seasonal variation in stroke rehabilitation episodes observed in previous reports, with a peak during winter and a trough in summer. As shown in Figure 4B, the average age was 73.1 years and ranged from 62.0 to 82.6 years across the AN-SNAP classes. The average FIM admission score was 78.2, and varied considerably from 53.1 to 103.7 across the AN-SNAP classes. The average length of stay (ALOS) was 25.8 days and ranged from 16.0 days for the least impaired class to 41.5 days for the most impaired class.

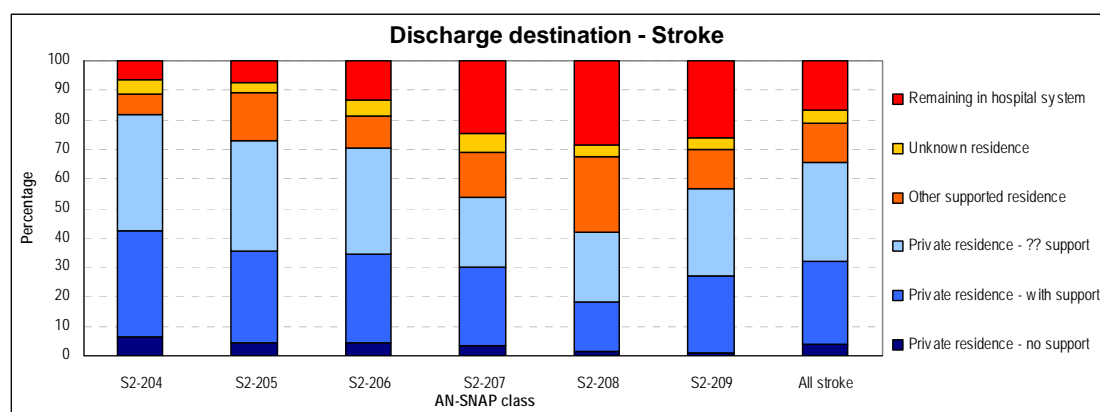
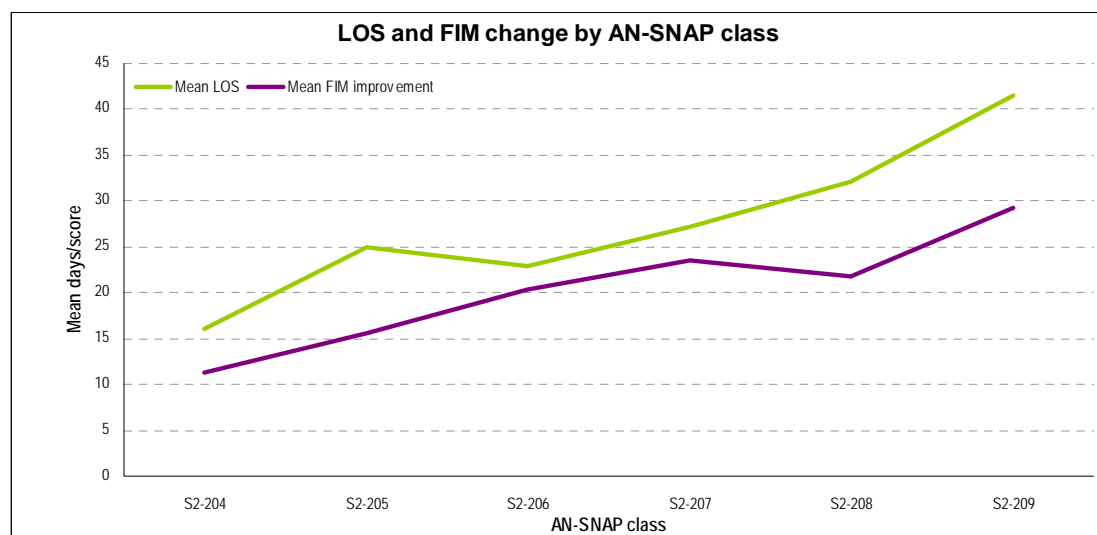
There was also a trend for the most impaired classes to show larger improvements in FIM scores; this is somewhat expected given that patients with a lower FIM admission score have a greater potential for functional improvement. However, FIM efficiency was greatest for the moderately impaired classes (S2-206 and S2-207). Figure 4C also demonstrates that individuals with greater impairments were less likely to be discharged into the community. For example, 92.4% to 93.7% of episodes from classes S2-204 and S2-205 were discharged into the community, compared to only 71.2% to 73.7% of episodes from classes S2-208 and S2-209.

**Figure 4A** *Change in number of stroke episodes over time (2003-2007)*



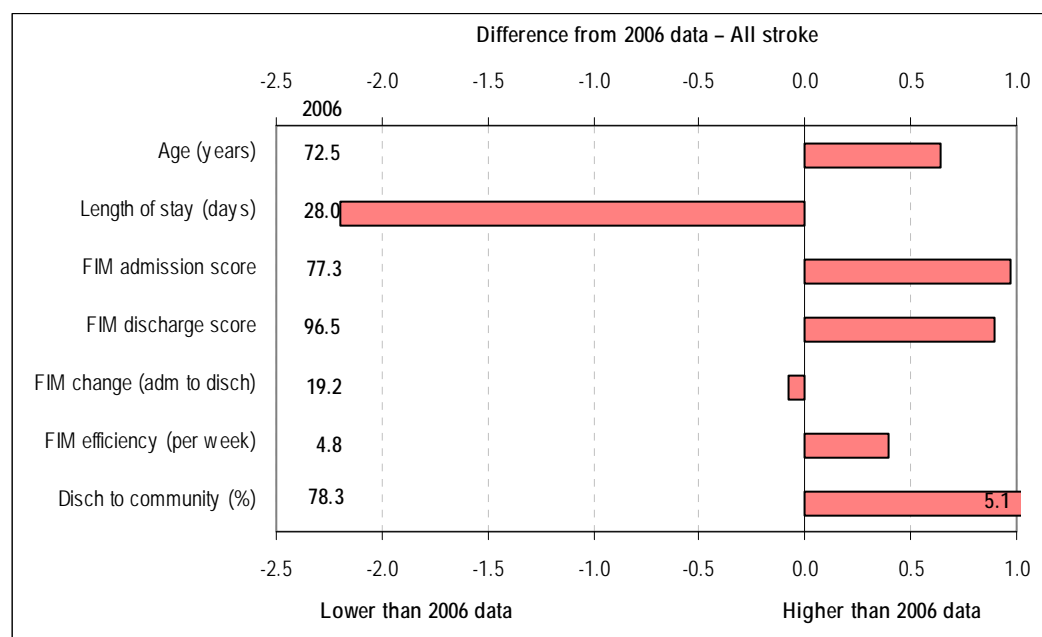
**Figure 5B Summary of stroke episodes in 2007**

AN-SNAP class:	S2-204	S2-205	S2-206	S2-207	S2-208	S2-209	All stroke
Number of episodes	1,529	132	1,299	93	1,048	836	4,937
Proportion of episodes	31.0%	2.7%	26.3%	1.9%	21.2%	16.9%	100.0%
Sector (%)							
Private	41.6	28.0	45.8	26.9	36.2	22.3	37.6
Public	58.4	72.0	54.2	73.1	63.8	77.7	62.4
Gender (%)							
Female	47.3	31.8	52.0	48.4	56.4	40.4	48.9
Male	52.7	68.2	48.0	51.6	43.6	59.6	51.1
Age (Mean+95%CI)	71.3 (70.5–72.0)	71.3 (68.8–73.8)	74.9 (74.2–75.6)	72.4 (69.4–75.4)	82.6 (82.3–82.9)	62.0 (61.3–62.8)	73.1 (72.7–73.5)
Admission FIM (Mean+95%CI)	103.7 (103.3–104.2)	87.6 (86.1–89.2)	82.6 (82.2–83.0)	65.0 (63.9–66.2)	53.1 (52.2–54.0)	53.3 (52.3–54.3)	78.2 (77.6–78.9)
LOS (Mean+95%CI)	16.0 (15.5–16.5)	25.0 (22.3–27.8)	23.0 (22.2–23.7)	27.1 (24.0–30.3)	32.0 (30.8–33.2)	41.5 (39.8–43.2)	25.8 (25.2–26.3)
Discharge destination (%)							
Discharged to community	93.7	92.4	86.8	75.3	71.2	73.7	83.3
Remaining in hospital system	6.3	7.6	13.2	24.7	28.8	26.3	16.7
FIM improvement (Mean+95%CI)	11.3 (10.8–11.7)	15.6 (13.7–17.5)	20.4 (19.6–21.1)	23.6 (20.2–26.9)	21.9 (20.6–23.1)	29.2 (27.7–30.7)	19.1 (18.7–19.6)
FIM efficiency (FIM imp./LOS)	0.7	0.6	0.9	0.9	0.7	0.7	0.7

**Figure 6C Stroke discharge destination****Figure 7D Stroke LOS & FIM change by AN-SNAP class****Key changes since 2006**

The key differences between the 2006 and 2007 data are presented in Figure 4E. The average FIM scores at admission and discharge increased by 1.0 and 0.9 respectively, whilst the ALOS decreased by 2.2 days. The proportion of rehabilitation episodes discharged into the community increased 5.1%, but there were no notable changes in FIM improvement or FIM efficiency.

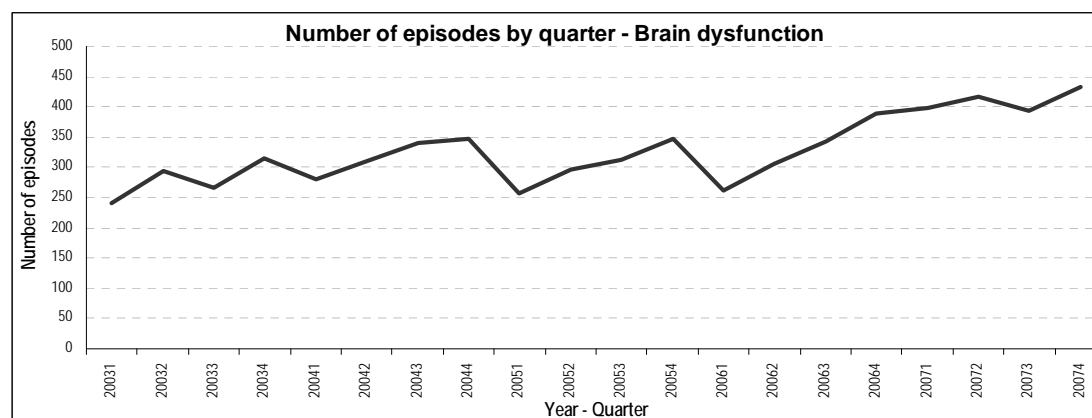
**Figure 8E** *Change in Outcome Measures in Stroke - 2006 to 2007*



### 3.2 Brain Dysfunction

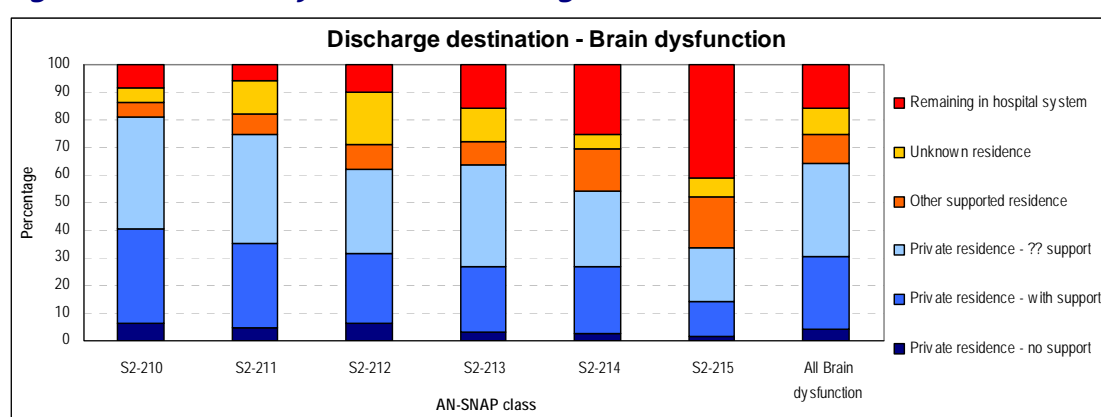
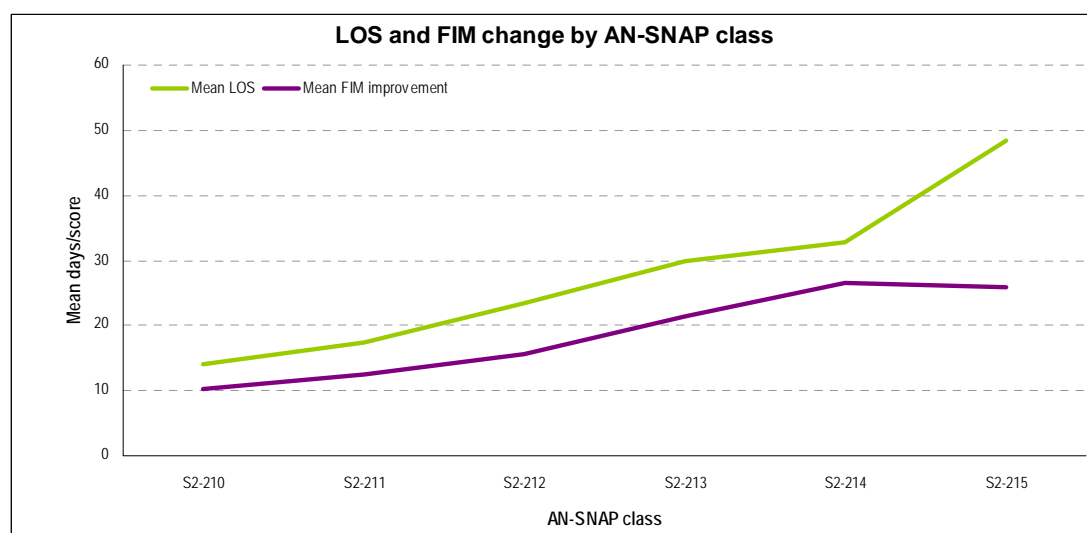
The average age for brain dysfunction episodes was 56.1 years, ranging from 48.2 years to 60.3 years across the AN-SNAP classes, and most were male (61.4%). The majority of episodes (57.6%) were provided by the public sector, although this was not the case for the least impaired classes (S2-210 and S2-211). The average FIM admission score was 84.3, and ranged from 32.2 to 107.3 across the AN-SNAP classes. The ALOS was 25.3 days and ranged from 14.1 days for the least impaired class to 48.4 days for the most impaired class. The overall FIM improvement was 18.3, with the most impaired classes (i.e. S2-214 and S2-215) showing the greatest improvements. However, FIM efficiency was lowest for class S2-215 but greatest for class S2-214, and hence did not follow a clear trend across the classes. Although the majority (84.0%) of brain dysfunction episodes were discharged to the community, this varied considerably according to the level of impairment. For example, only 59.2% of episodes with the greatest impairment (S2-215) were discharged to the community compared to 94.2% of the least impaired episodes (S2-211).

**Figure 5A** *Change in number of brain dysfunction episodes over time (2003-2007)*



**Figure 5B Summary of brain dysfunction episodes in 2007**

AN-SNAP class:	S2-210	S2-211	S2-212	S2-213	S2-214	S2-215	All Brain dysfunction
Number of episodes	245	413	127	154	419	125	1,483
Proportion of episodes	16.5%	27.8%	8.6%	10.4%	28.3%	8.4%	100.0%
Sector (%)							
Private	68.9	49.4	35.4	15.3	38.6	19.5	42.4
Public	31.1	50.6	64.6	84.7	61.4	80.5	57.6
Gender (%)							
Female	48.2	40.0	28.3	24.7	41.3	34.4	38.6
Male	51.8	60.0	71.7	75.3	58.7	65.6	61.4
Age (Mean+95%CI)	60.3 (57.6–63.0)	56.3 (54.1–58.4)	51.0 (47.5–54.6)	48.2 (45.3–51.1)	60.2 (58.2–62.3)	48.3 (44.7–52.0)	56.1 (55.0–57.2)
Admission FIM (Mean+95%CI)	107.3 (106.0–108.6)	110.0 (99.9–102.1)	94.0 (91.9–96.0)	86.9 (85.1–88.7)	63.4 (62.1–64.8)	32.2 (30.7–33.7)	84.3 (83.0–85.6)
LOS (Mean+95%CI)	14.1 (12.8–15.3)	17.5 (16.4–18.5)	23.4 (20.2–26.7)	29.8 (26.5–33.1)	32.9 (30.8–35.0)	48.4 (42.8–54.0)	25.3 (24.3–26.4)
Discharge destination (%)							
Discharged to community	91.4	94.2	89.8	84.4	74.9	59.2	84.0
Remaining in hospital system	8.6	5.8	10.2	15.6	25.1	40.8	16.0
FIM improvement (Mean+95%CI)	10.2 (9.0–11.4)	12.5 (11.3–13.6)	15.7 (13.5–17.9)	21.5 (19.1–23.9)	26.6 (24.4–28.9)	25.9 (20.3–31.5)	18.3 (17.3–19.3)
FIM efficiency (FIM imp./LOS)	0.7	0.7	0.7	0.7	0.8	0.5	0.7

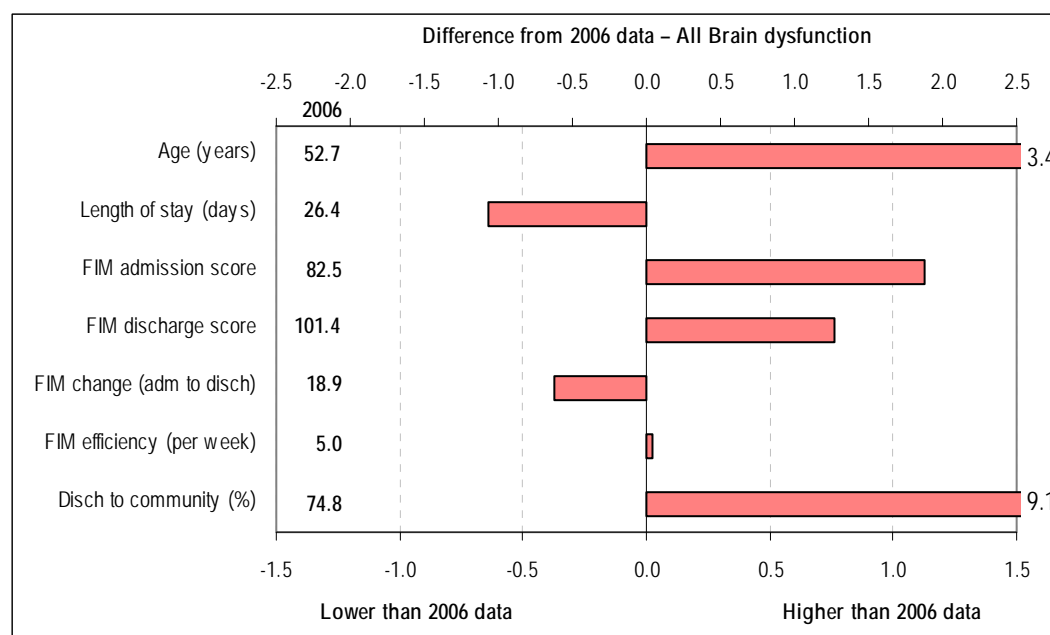
**Figure 5C Brain dysfunction discharge destination****Figure 5D Brain dysfunction LOS & FIM change by AN-SNAP class**

### Key changes since 2006

The key differences between the 2006 and 2007 data are presented in Figure 5E. The average age of brain dysfunction episodes increased by 3.4 years, which continues the trend observed in recent years. The proportion of episodes provided by the public sector decreased substantially from 74.3% to 57.6%. The average FIM scores at admission and discharge increased by 1.9 and 1.3 respectively, but neither FIM improvement nor FIM efficiency changed noticeably. The ALOS

decreased by 1.1 days, which is also consistent with recent trends, and the proportion of brain dysfunction episodes discharged to the community increased 9.1%.

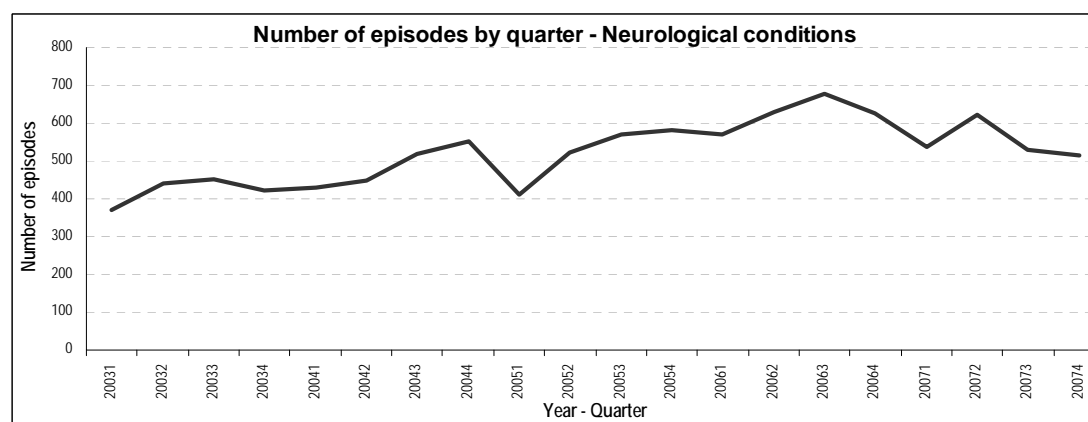
**Figure 5E** *Change in Outcome Measures in Brain Dysfunction - 2006 to 2007*



### 3.3 Neurological Conditions

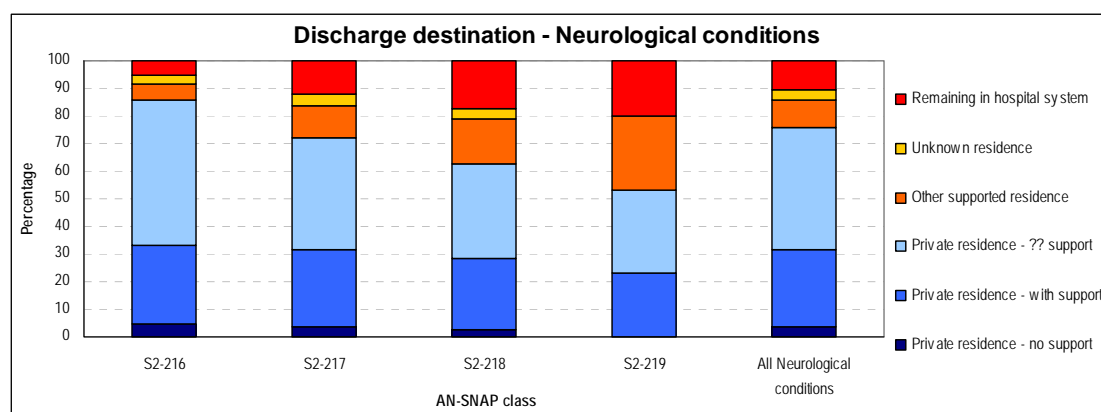
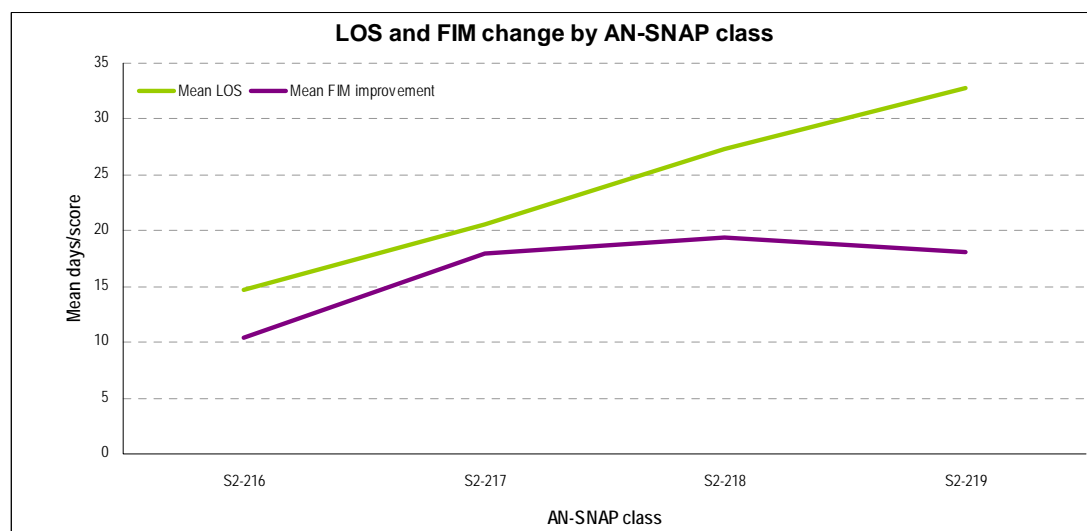
This impairment category contains patients undergoing rehabilitation for multiple sclerosis, parkinsonism, polyneuropathy, Guillian-Barre, cerebral palsy, and neuromuscular disorders. The most common neurological class was S2-216, which accounted for 45.2% of all episodes within this category. The average age of was 67.2 years; the majority of episodes were provided by the private sector (62.8%), with the exception of the most impaired class. The average FIM admission score was 87.5, and ranged from 39.6 to 104.3 across the four classes. The ALOS was 19.7 days and ranged from 14.7 days for the least impaired class to 32.8 days for the most impaired class. The average FIM improvement was 14.9 with the more impaired classes showing the greatest improvements; however, FIM efficiency was lowest for the most impaired class (S2-219). The majority of episodes (89.6%) were discharged into the community and this was fairly consistent across the four classes.

**Figure 6A** *Change in number of neurological condition episodes over time (2003-2007)*



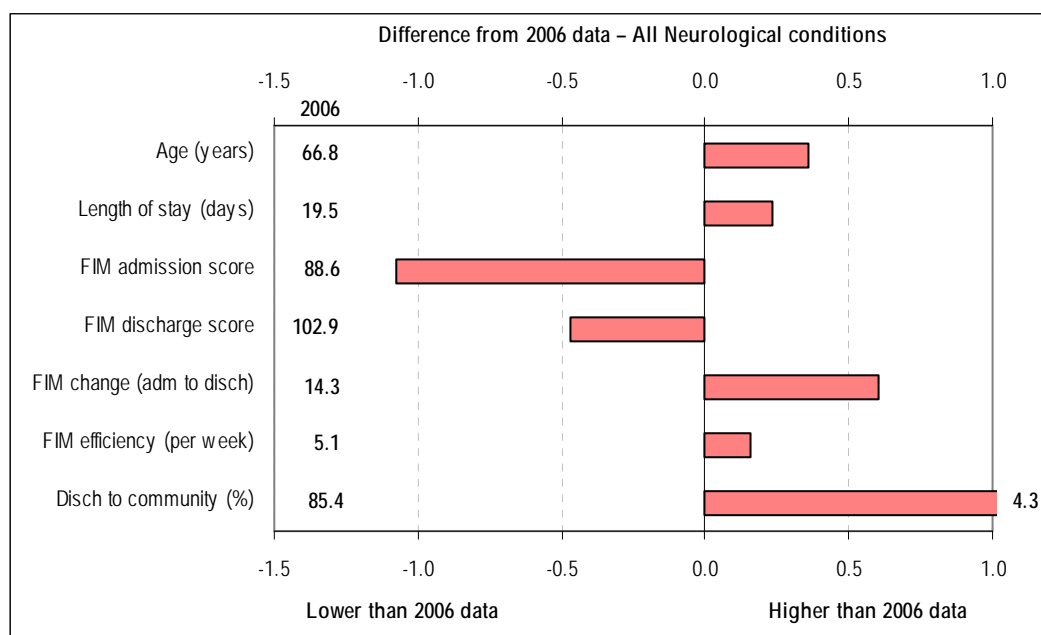
**Figure 6B Summary of neurological condition episodes in 2007**

AN-SNAP class:	S2-216	S2-217	S2-218	S2-219	All Neurological conditions
Number of episodes	973	590	559	30	2,152
Proportion of episodes	45.2%	27.4%	26.0%	1.4%	100.0%
Sector (%)					
Private	71.5	65.5	46.8	30.0	62.8
Public	28.5	34.5	53.2	70.0	37.2
Gender (%)					
Female	54.5	56.4	50.5	43.3	53.8
Male	45.5	43.6	49.5	56.7	46.2
Age (Mean+95%CI)	65.6 (64.5–66.7)	71.0 (69.8–72.3)	66.1 (64.7–67.5)	61.4 (54.2–68.5)	67.2 (66.5–67.9)
Admission FIM (Mean+95%CI)	104.3 (103.8–104.9)	84.4 (83.8–85.0)	62.8 (61.8–63.9)	39.6 (35.5–43.7)	87.5 (86.7–88.4)
LOS (Mean+95%CI)	14.7 (14.1–15.2)	20.6 (19.6–21.6)	27.3 (25.8–28.8)	32.8 (22.8–42.7)	19.7 (19.1–20.3)
Discharge destination (%)					
Discharged to community	95.0	88.0	82.6	80.0	89.6
Remaining in hospital system	5.0	12.0	17.4	20.0	10.4
FIM improvement (Mean+95%CI)	10.4 (9.9–10.9)	18.0 (16.9–19.0)	19.4 (17.9–21.0)	18.1 (7.6–28.6)	14.9 (14.3–15.4)
FIM efficiency (FIM imp./LOS)	0.7	0.9	0.7	0.6	0.8

**Figure 6C Neurological condition discharge destination****Figure 6D Neurological condition LOS & FIM change by AN-SNAP class****Key changes since 2006**

The key differences between the 2006 and 2007 data are presented in Figure 6E. In particular, the average FIM admission and discharge scores decreased by 1.1 and 0.5 respectively, and FIM improvement increased slightly by 0.6. Furthermore, the proportion of episodes discharged to the community increased 4.3%.

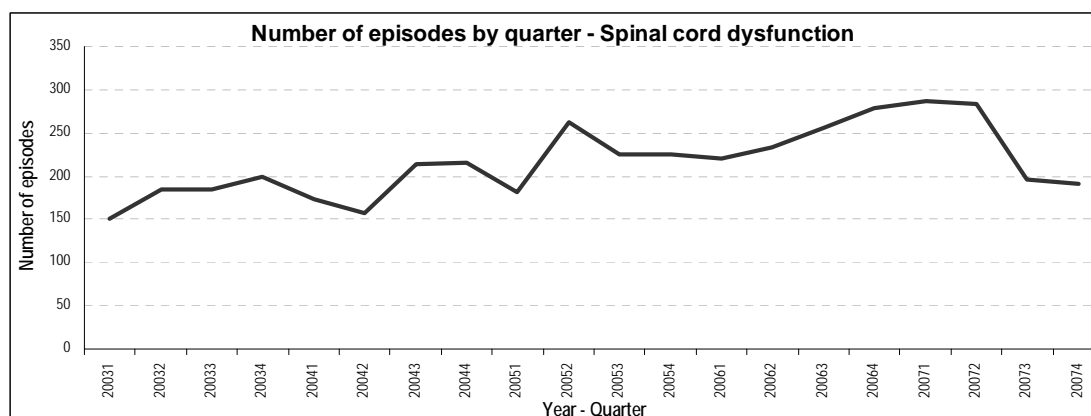
**Figure 6E** *Change in Outcome Measures in Neurological Conditions - 2006 to 2007*



### 3.4 Spinal Cord Dysfunction

The majority of spinal cord dysfunction episodes were provided by the public sector (73.4%), with class S2-221 accounting for the majority of episodes (51.4%). The average age was 57.4 years and this differed considerably between classes S2-222 and S2-223; this is not surprising given that these classes represent two distinct age categories (i.e.  $\leq 32$  years and  $\geq 33$  years). The majority of spinal cord dysfunction episodes were male (58.1%) and this pattern was consistent across the classes but was most pronounced for classes S2-222 and S2-223. The average FIM admission score was 84.3 and ranged from 61.7 to 118.5 across the four AN-SNAP classes. The average FIM improvement was 15.0, and the largest improvements were observed in the most impaired classes. The average FIM efficiency was 0.5 and was lowest for the least impaired class (S2-220). The ALOS was 31.9 days and ranged from 14.1 days for the least impaired class to 50.5 days for the most impaired class.

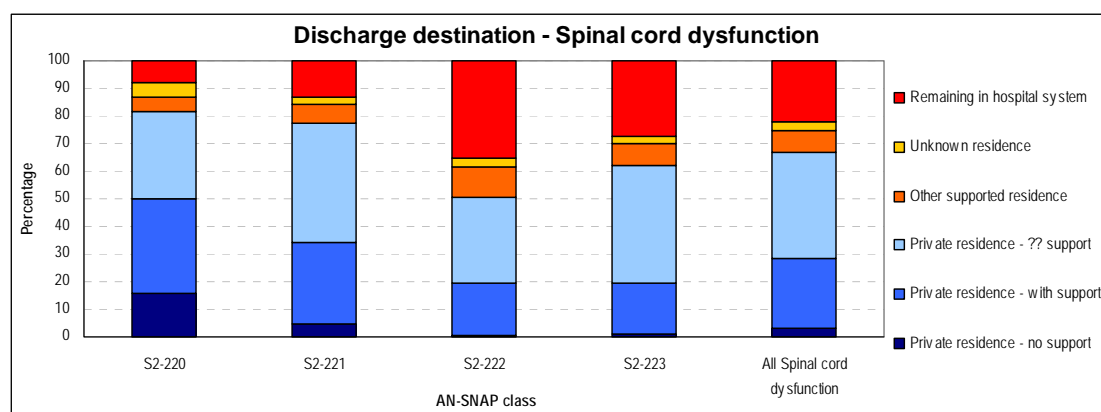
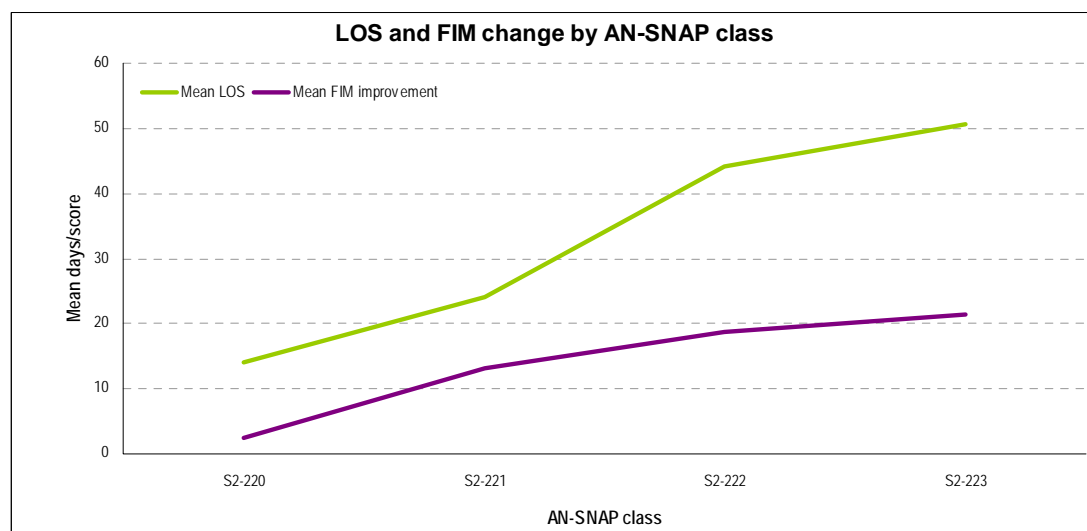
**Figure 7A** *Change in number of spinal cord dysfunction episodes over time (2003-2007)*





**Figure 7B Summary of spinal cord dysfunction episodes in 2007**

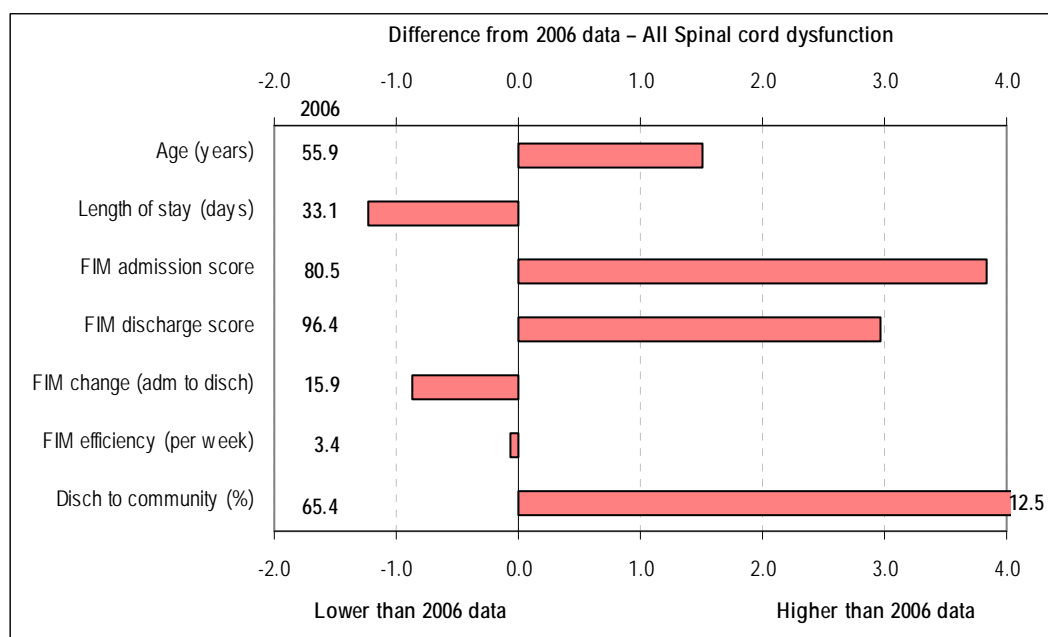
AN-SNAP class:	S2-220	S2-221	S2-222	S2-223	All Spinal cord dysfunction
Number of episodes	38	455	316	77	886
Proportion of episodes	4.3%	51.4%	35.7%	8.7%	100.0%
Sector (%)					
Private	42.1	38.1	13.8	2.6	26.6
Public	57.9	61.9	86.2	97.4	73.4
Gender (%)					
Female	42.1	50.3	36.1	15.6	41.9
Male	57.9	49.7	63.9	84.4	58.1
Age (Mean+95%CI)	54.2 (48.2–60.1)	60.2 (58.5–62.0)	62.1 (60.5–63.6)	22.7 (21.5–23.8)	57.4 (56.1–58.7)
Admission FIM (Mean+95%CI)	118.5 (117.1–119.9)	96.5 (95.5–97.4)	63.4 (62.0–64.7)	61.7 (59.0–64.4)	84.3 (82.9–85.8)
LOS (Mean+95%CI)	14.1 (7.5–20.6)	24.1 (22.3–25.9)	44.1 (40.7–47.5)	50.5 (41.9–59.2)	31.9 (30.1–33.7)
Discharge destination (%)					
Discharged to community	92.1	86.8	64.6	72.7	77.9
Remaining in hospital system	7.9	13.2	35.4	27.3	22.1
FIM improvement (Mean+95%CI)	2.4 (1.3–3.4)	13.1 (12.0–14.3)	18.7 (16.4–21.1)	21.3 (14.9–27.8)	15.0 (13.9–16.1)
FIM efficiency (FIM imp./LOS)	0.2	0.5	0.4	0.4	0.5

**Figure 7C Spinal cord dysfunction discharge destination****Figure 7D Spinal cord dysfunction LOS & FIM change by AN-SNAP class**

### Key changes since 2006

The key differences between the 2006 and 2007 data are presented in Figure 7E. The average age increased by 1.5 years and the proportion of males declined from 64.6% to 58.1%. Furthermore, the average FIM scores at admission and discharge increased by 3.8 and 3.0 respectively, and FIM improvement declined by 0.9. Finally, the ALOS decreased by 1.2 days and the proportion of episodes discharged to the community increased 12.5%.

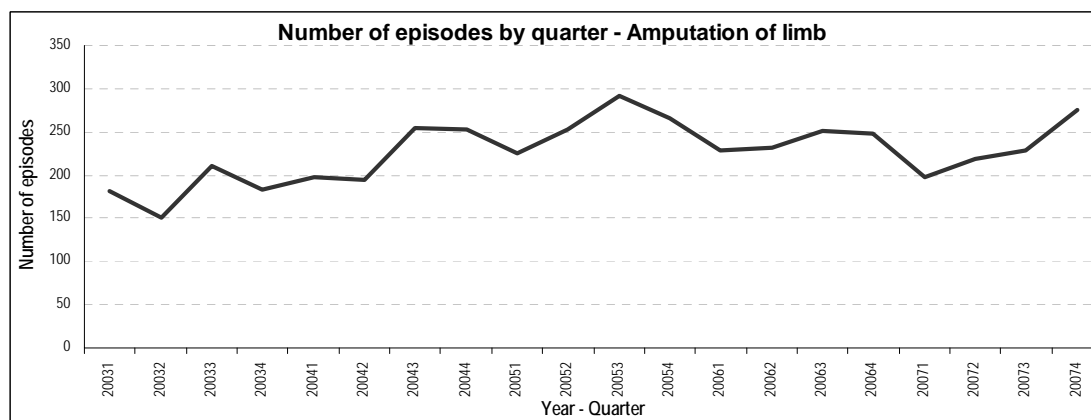
**Figure 7E** *Change in Outcome Measures in Spinal Cord Dysfunction - 2006 to 2007*



### 3.5 Amputation of Limb

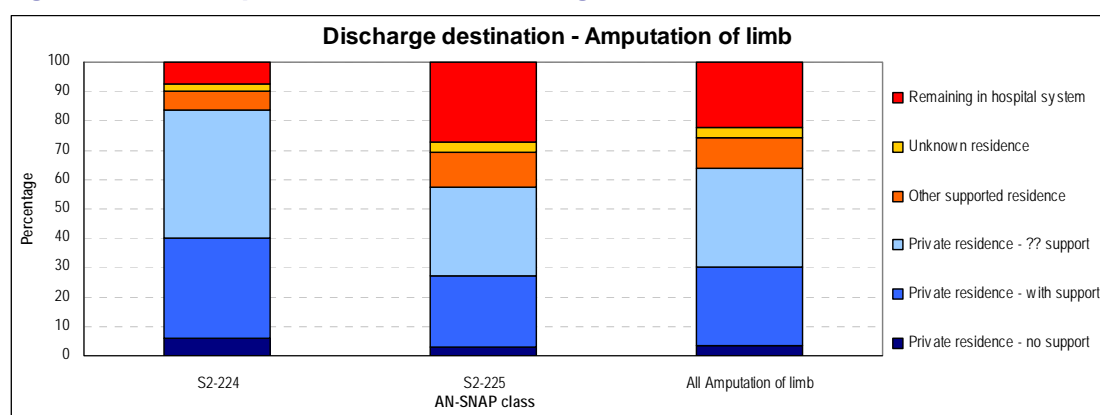
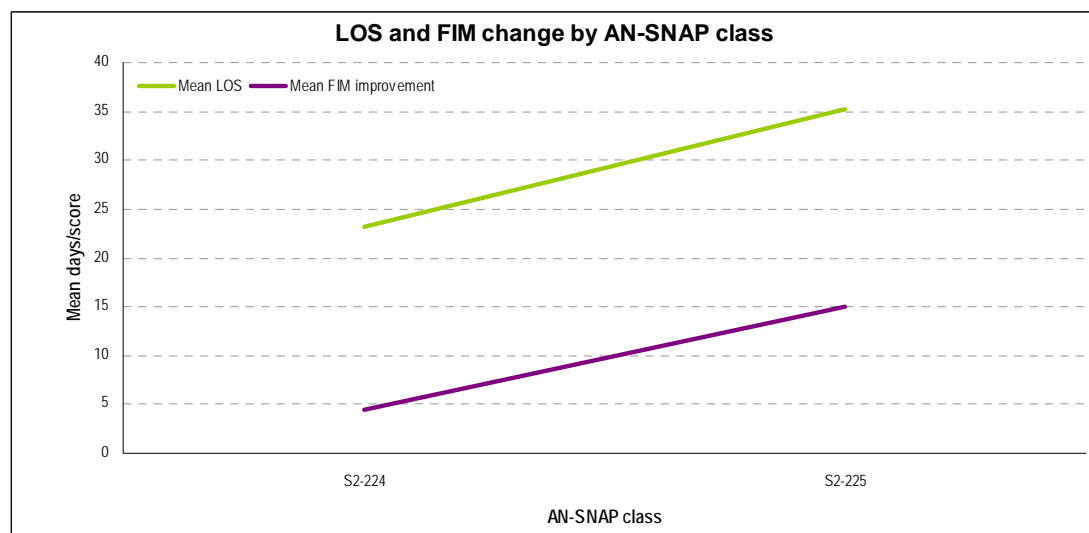
There are two AN-SNAP classes within this impairment category, with class S2-225 accounting for the majority of episodes (75.7%). The public sector provided the majority of episodes (79.7%), which was consistent across the two classes. Furthermore, more than two-thirds of episodes were male (70.4%) and the average age was 67.6 years. The average FIM at admission was 90.4 and the average FIM improvement was 12.5. The most impaired class showed a greater FIM improvement, a higher FIM efficiency and a longer ALOS. Consistent with the other AN-SNAP classes, episodes in the most impaired class were less likely to be discharged into the community.

**Figure 8A** *Change in number of amputation of limb episodes over time (2003-2007)*



**Figure 8B Summary of amputation of limb episodes in 2007**

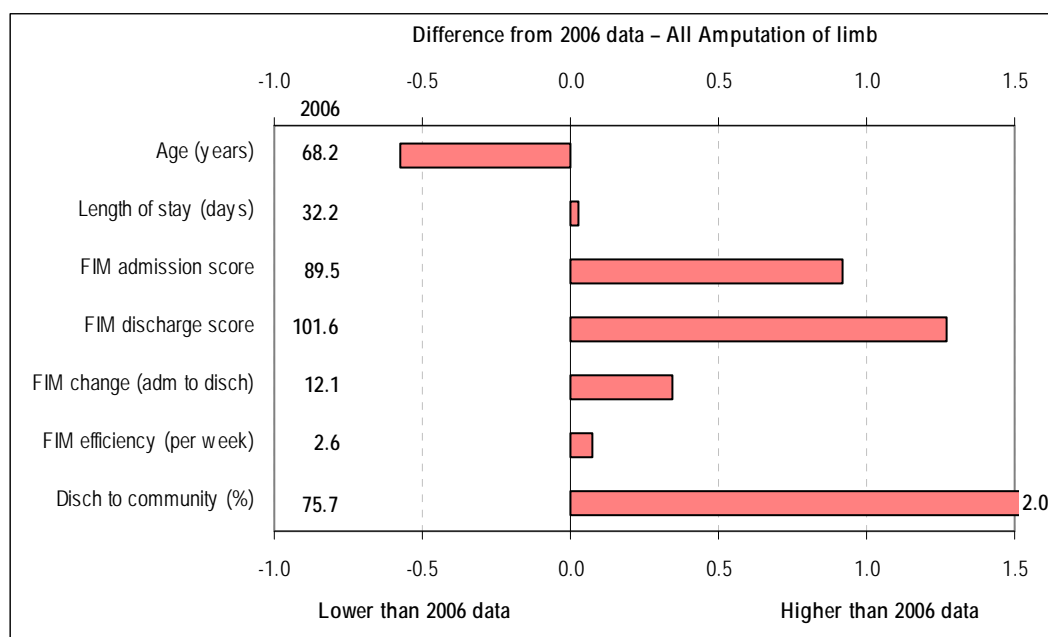
AN-SNAP class:	S2-224	S2-225	All Amputation of limb
Number of episodes	219	684	903
Proportion of episodes	24.3%	75.7%	100.0%
Sector (%)			
Private	16.0	21.6	20.3
Public	84.0	78.4	79.7
Gender (%)			
Female	16.5	33.8	29.6
Male	83.5	66.2	70.4
Age (Mean+95%CI)	60.1 (58.0–62.2)	70.0 (69.0–71.0)	67.6 (66.6–68.6)
Admission FIM (Mean+95%CI)	111.0 (110.3–111.6)	83.6 (82.4–84.9)	90.4 (89.2–91.6)
LOS (Mean+95%CI)	23.3 (20.7–25.8)	35.2 (33.6–36.8)	32.3 (30.9–33.7)
Discharge destination (%)			
Discharged to community	92.7	72.8	77.6
Remaining in hospital system	7.3	27.2	22.4
FIM improvement (Mean+95%CI)	4.5 (3.8–5.3)	15.1 (14.1–16.0)	12.5 (11.7–13.3)
FIM efficiency (FIM imp./LOS)	0.2	0.4	0.4

**Figure 8C Amputation of limb discharge destination****Figure 8D Amputation of limb LOS & FIM change by AN-SNAP class**

### Key changes since 2006

The key differences between the 2006 data and the 2007 data are presented in Figure 8.D. The proportion of females increased slightly from 27.0% to 29.6% and there was a slight reduction in the proportion of episodes provided in the public sector from 83.9% to 79.7%. The average FIM scores on admission and at discharge increased by 0.9 and 1.3 respectively, and the proportion of episodes discharged to the community also increased 2.0%.

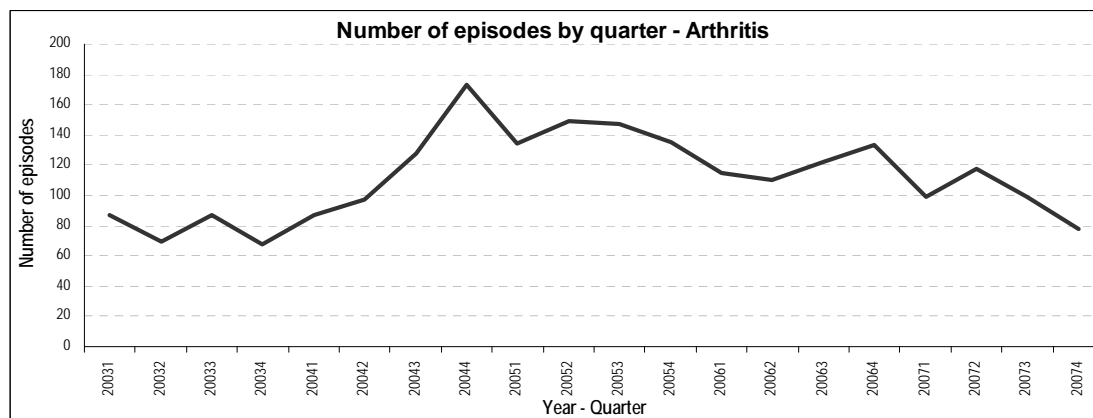
**Figure 8E** *Change in Outcome Measures in Amputation of Limb - 2006 to 2007*



### 3.6 Arthritis

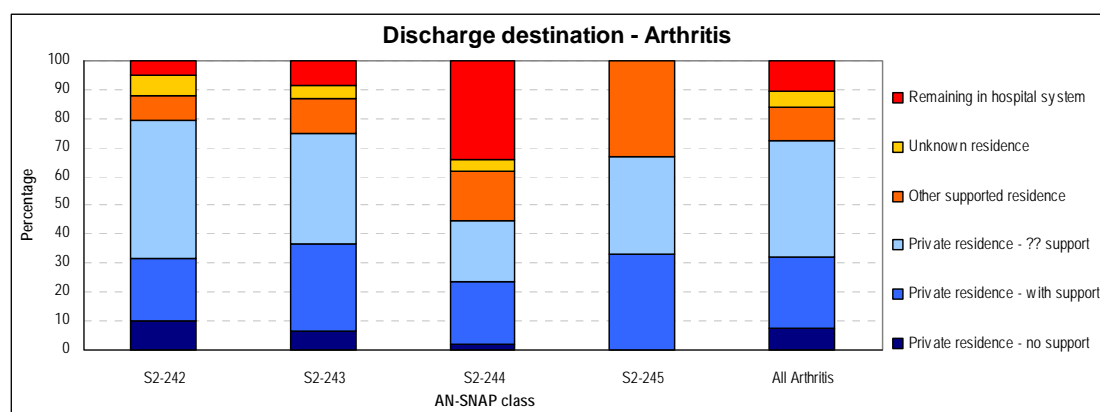
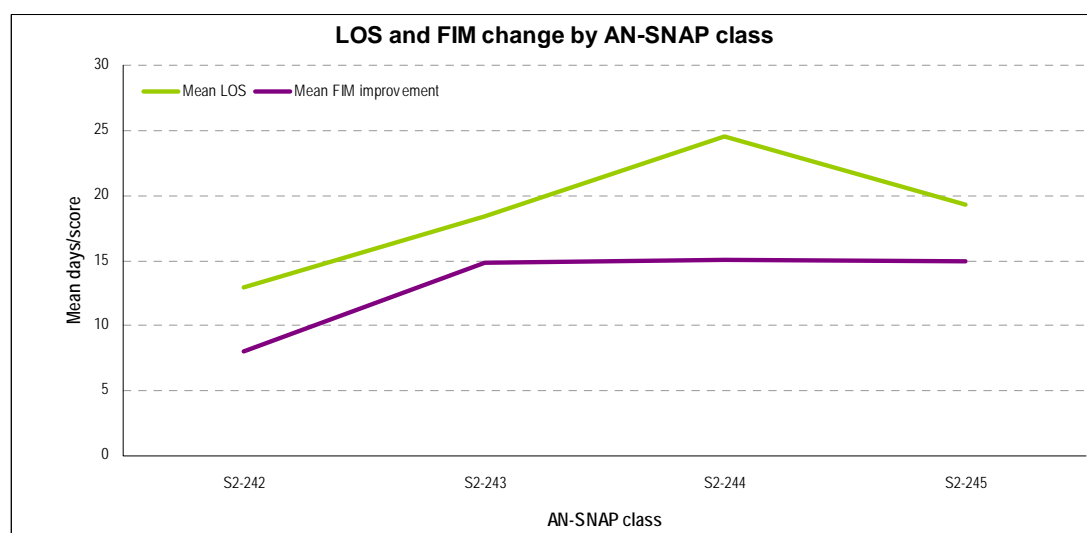
The volume of arthritis episodes continues to decline. In 2007 there were 314 episodes, down from 608 in 2005, a decline of almost 50%. It has been suggested that this is due to a change in the treatment of choice for arthritis; pharmacological treatment is now much more common. There are four AN-SNAP classes within this impairment category. Most episodes had female patients (68.8%) while class S2-242 accounts for half of all episodes. The majority of episodes were provided by the private sector (61.5%) with the exception of classes S2-244 and S2-245 where the public sector provided the majority of episodes (however the number of episodes in each of these classes is low). The average age was 75.2 years and this was fairly consistent across the four classes. The average FIM admission score was 95.9 and ranged from 44.0 to 107.6 across the four AN-SNAP classes. The ALOS was 16.6 days, and increased with increasing level of impairment. The average FIM improvement was 11.4 and was greatest for the most impaired classes. A total of 89.5% of episodes were discharged to the community.

**Figure 9A** *Change in number of arthritis over time (2003-2007)*



**Figure 9B Summary of arthritis episodes in 2007**

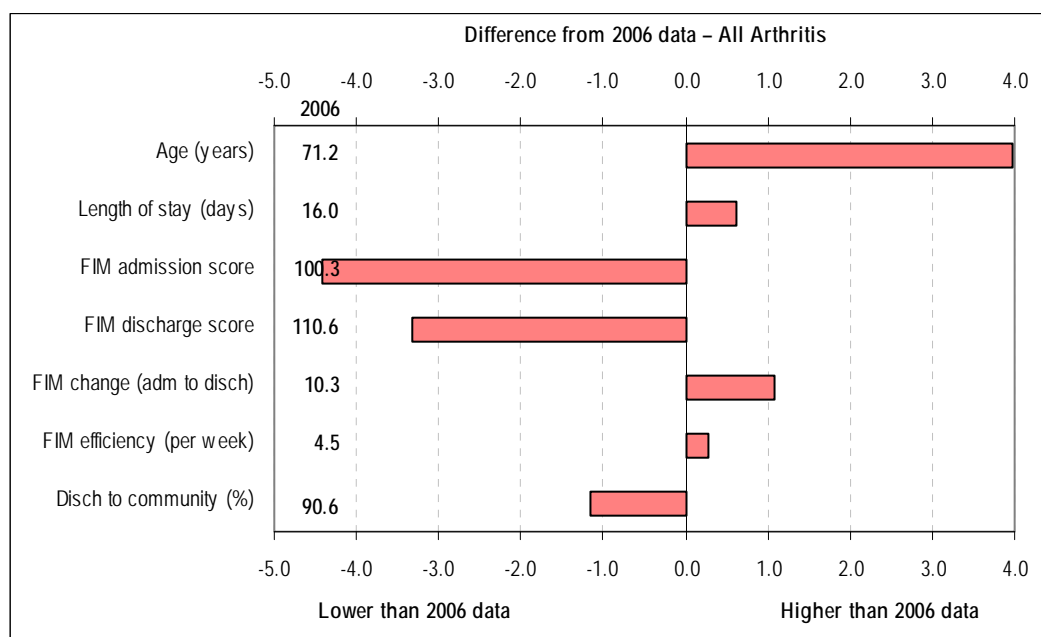
AN-SNAP class:	S2-242	S2-243	S2-244	S2-245	All Arthritis
Number of episodes	157	107	47	3	314
Proportion of episodes	50.0%	34.1%	15.0%	1.0%	100.0%
Sector (%)					
Private	70.7	58.9	38.3	33.3	61.5
Public	29.3	41.1	61.7	66.7	38.5
Gender (%)					
Female	71.3	64.5	68.1	100.0	68.8
Male	28.7	35.5	31.9	0.0	31.2
Age (Mean+95%CI)	71.7 (69.5–73.8)	78.3 (76.4–80.2)	79.9 (76.9–82.8)	77.0 (53.0–101.0)	75.2 (73.8–76.6)
Admission FIM (Mean+95%CI)	107.6 (106.5–108.6)	91.1 (89.8–92.4)	70.5 (67.5–73.5)	44.0 (17.7–70.3)	95.9 (94.1–97.6)
LOS (Mean+95%CI)	12.9 (11.7–14.1)	18.4 (15.8–21.0)	24.5 (19.8–29.2)	19.3 (-3.6–42.3)	16.6 (15.2–17.9)
Discharge destination (%)					
Discharged to community	94.9	91.6	66.0	100.0	89.5
Remaining in hospital system	5.1	8.4	34.0	0.0	10.5
FIM improvement (Mean+95%CI)	8.0 (7.2–8.8)	14.8 (12.8–16.7)	15.0 (10.7–19.3)	15.0 (-49.5–79.5)	11.4 (10.3–12.5)
FIM efficiency (FIM imp./LOS)	0.6	0.8	0.6	0.8	0.7

**Figure 9C Arthritis discharge destination****Figure 9D Arthritis LOS & FIM change by AN-SNAP class**

### Key changes since 2006

The key differences between the 2006 and 2007 data are presented in Figure 9E. The average age increased by 4.0 years, and the proportion of episodes provided by the private sector decreased slightly from 65.3% to 61.5%. The average FIM scores at admission and discharge decreased by 4.4 and 3.3 respectively, and FIM improvement increased by 1.1. Finally, the proportion of episodes discharged to the community decreased by 1.2%.

**Figure 9E Change in Outcome Measures in Arthritis - 2006 to 2007**

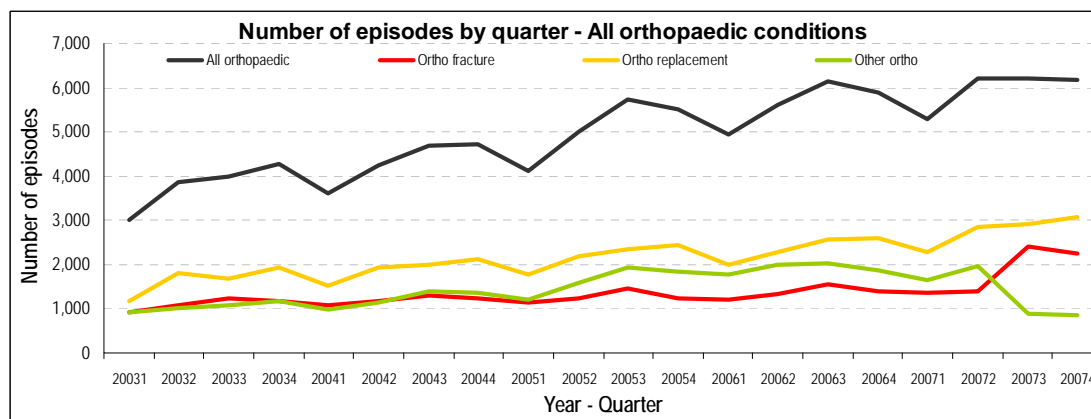


### 3.7 Orthopaedic Conditions

The data for patients with orthopaedic conditions has been separated into fractures, joint replacements and other. Given that the resource needs and outcomes of patients with fractures and joint replacements are distinct, their outcomes are shown separately. Also presented are the data for the entire orthopaedic conditions cohort. While the “other” category comprised 22% of all orthopaedic episodes, it is not presented in detail. These episodes were the subject of a review in 2006 and improved data collection since July 2007 has seen a dramatic drop in other orthopaedic episodes, and a resultant increase in the number of orthopaedic fracture and orthopaedic replacement episodes. Information about all orthopaedic episodes in 2007 is presented in Figure 10, A–E, while information specific to episodes with fractures is presented in Figure 11, A–E and information specific to episodes with joint replacements is presented in Figure 12, A–E.

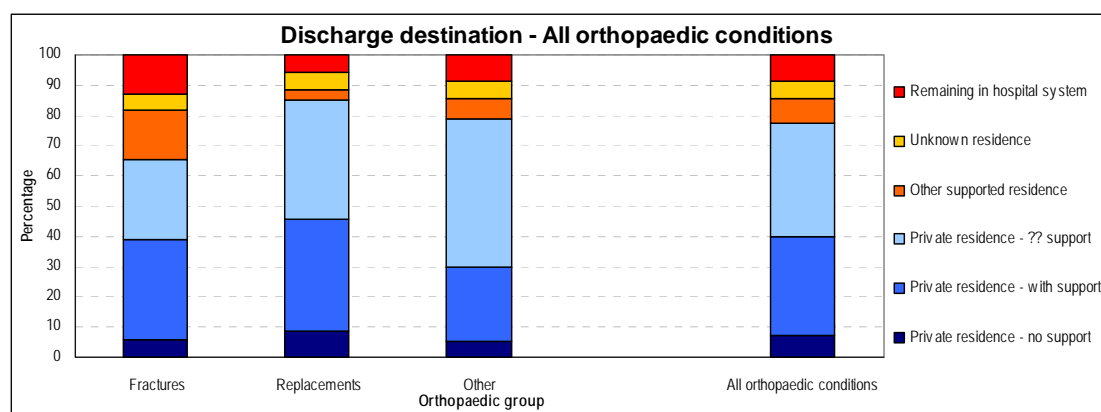
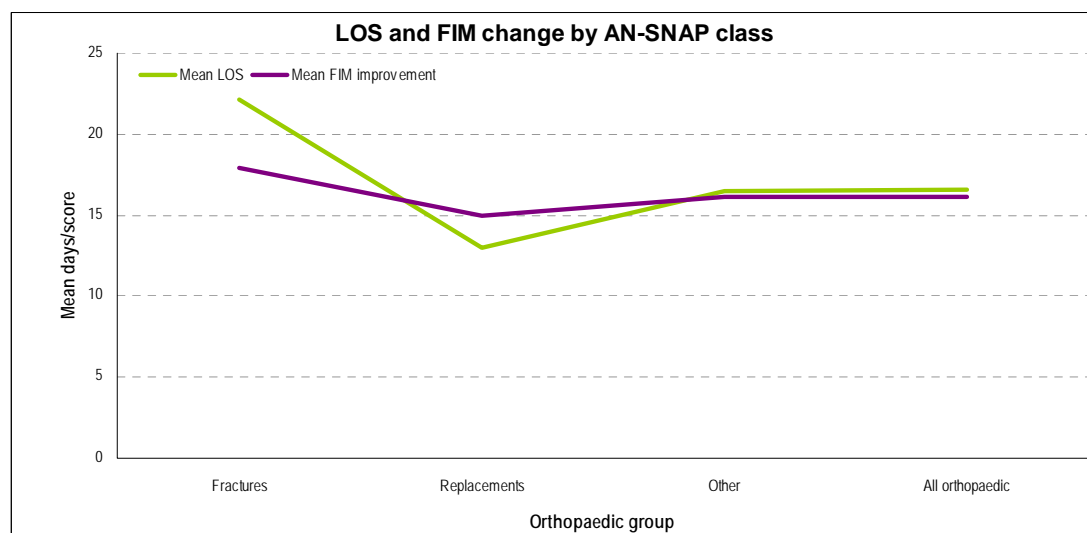
In Figure 1 it can be seen that joint replacements and other orthopaedic conditions were most likely to occur in the private sector, while fractures were equally likely to be treated in the public sector. Generally orthopaedic fracture episodes had lower admission FIMs with longer LOS, they were slightly older and less likely to be discharged to the community than joint replacement or other orthopaedic episodes. Joint replacements and other orthopaedic episodes were very similar.

**Figure 10A Change in number of orthopaedic conditions over time (2003-2007)**

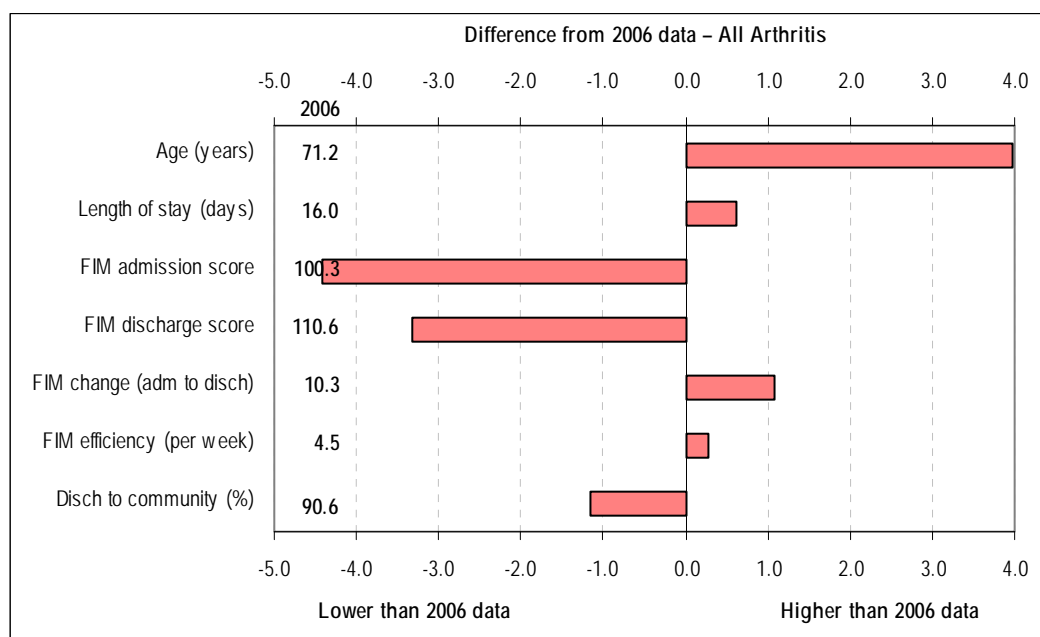


**Figure 10B Summary of orthopaedic conditions episodes in 2007**

	Fractures	Replacements	Other	All orthopaedic conditions
Number of episodes	7,328	11,033	5,309	23,670
Proportion of episodes	31.0%	46.6%	22.4%	100.0%
Sector (%)				
Private	54.2	84.9	79.1	74.1
Public	45.8	15.1	20.9	25.9
Gender (%)				
Female	73.1	66.6	68.0	68.9
Male	26.9	33.4	32.0	31.1
Age (Mean+95%CI)	78.7 (78.3–79.0)	72.9 (72.7–73.0)	72.7 (72.3–73.1)	74.6 (74.5–74.8)
Admission FIM (Mean+95%CI)	83.3 (82.9–83.7)	98.2 (98.0–98.5)	93.5 (93.0–93.9)	92.6 (92.4–92.8)
LOS (Mean+95%CI)	22.2 (21.9–22.5)	13.0 (12.9–13.1)	16.5 (16.2–16.8)	16.6 (16.5–16.8)
Discharge destination (%)				
Discharged to community	86.9	94.2	91.5	91.3
Remaining in hospital system	13.1	5.8	8.5	8.7
FIM improvement (Mean+95%CI)	17.9 (17.6–18.2)	15.0 (14.8–15.2)	16.1 (15.8–16.5)	16.1 (16.0–16.3)
FIM efficiency (FIM imp./LOS)	0.8	1.2	1.0	1.0

**Figure 10C Orthopaedic conditions discharge destination****Figure 10D Orthopaedic conditions LOS & FIM change by AN-SNAP class**

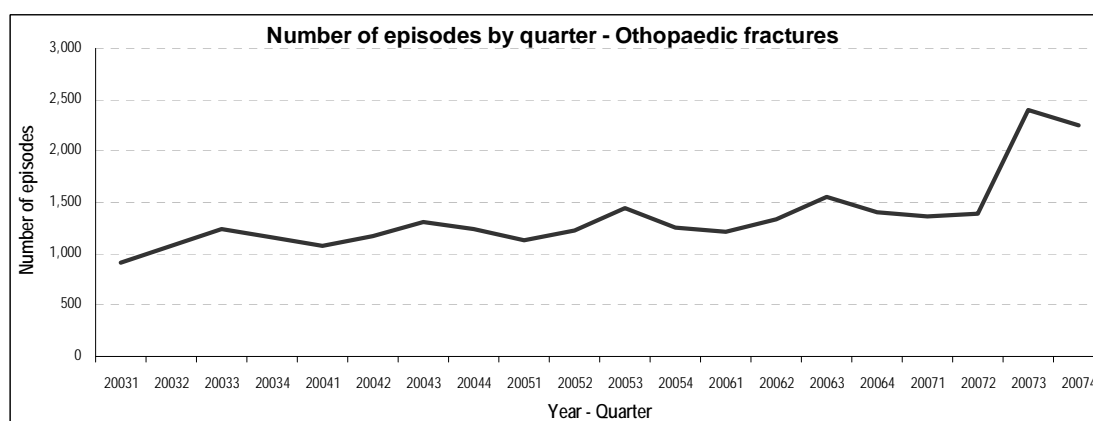
**Figure 10E Change in Outcome Measures in Orthopaedic Conditions - 2006 to 2007**



### 3.7.1 Orthopaedic: fractures

As shown in Figure 10A, there appeared to be some degree of seasonality in this impairment category, particularly over the past year, with episode volumes peaking in the third quarter (winter) of each year. The large increase in the last two quarters of the data can be attributed to a change in the collection of the impairment code which resulted in more accurately collected data – this change was a direct result of an audit conducted on orthopaedic data in 2007. The majority of orthopaedic fractures were female (73.1%), with an average age of 78.7 years; however, the proportion of females declined and age increased with increasing impairment. The average FIM on admission was 83.3 and ranged from 45.9 to 98.4 across the classes. The most impaired classes had the longest ALOS and showed the greatest FIM improvement. Consistent with the other categories, the most impaired patients were less likely to be discharged into the community.

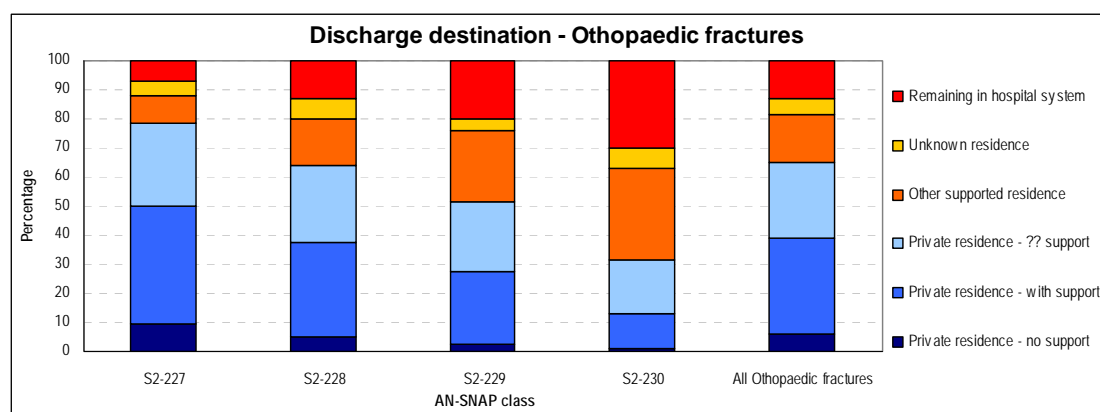
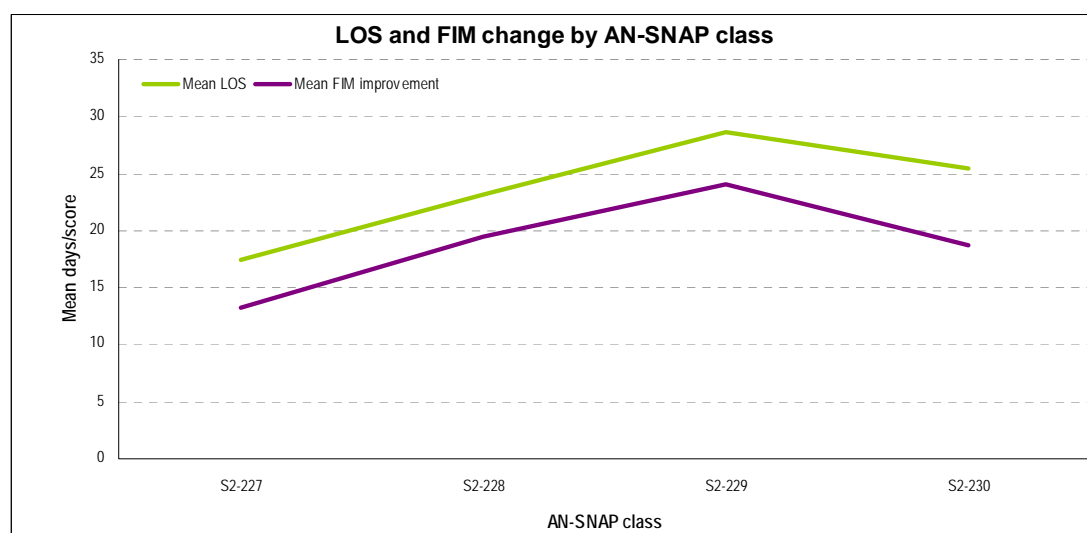
**Figure 11A Change in number of orthopaedic fractures over time (2003-2007)**





**Figure 11B Summary of orthopaedic fractures episodes in 2007**

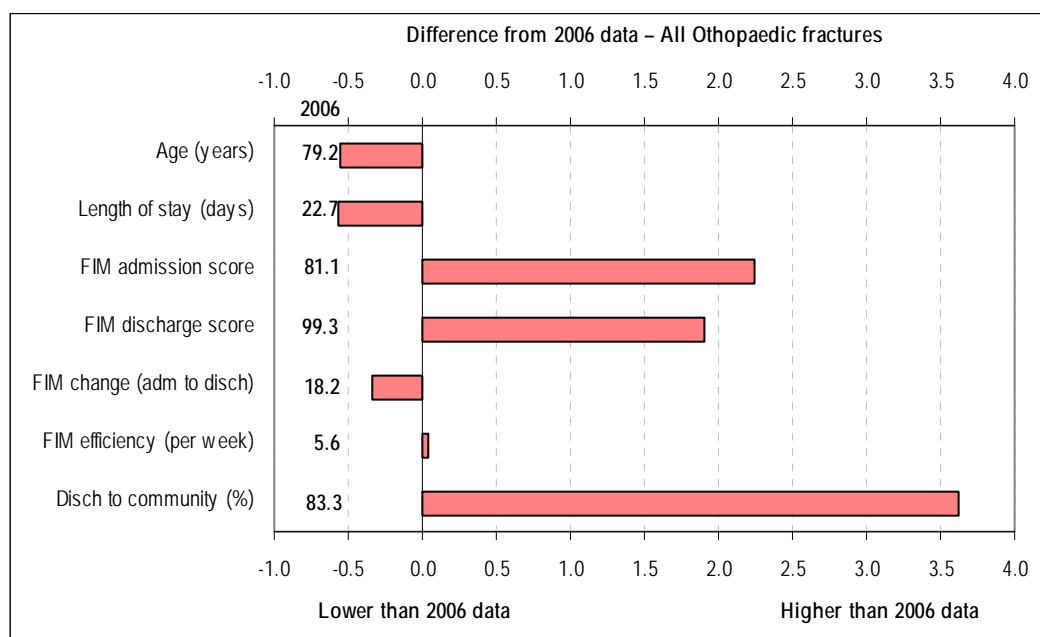
AN-SNAP class:	S2-227	S2-228	S2-229	S2-230	All Orthopaedic fractures
Number of episodes	3,158	1,913	1,837	420	7,328
Proportion of episodes	43.1%	26.1%	25.1%	5.7%	100.0%
Sector (%)					
Private	58.8	56.5	48.1	36.2	54.2
Public	41.2	43.5	51.9	63.8	45.8
Gender (%)					
Female	74.6	73.8	71.2	66.9	73.1
Male	25.4	26.2	28.8	33.1	26.9
Age (Mean+95%CI)	76.0 (75.5–76.5)	79.7 (79.2–80.3)	81.1 (80.6–81.7)	83.1 (82.2–84.0)	78.7 (78.3–79.0)
Admission FIM (Mean+95%CI)	98.4 (98.1–98.7)	82.1 (81.8–82.4)	66.6 (66.2–67.1)	45.9 (44.8–46.9)	83.3 (82.9–83.7)
LOS (Mean+95%CI)	17.5 (17.1–17.8)	23.1 (22.5–23.7)	28.7 (27.9–29.4)	25.5 (24.0–26.9)	22.2 (21.9–22.5)
Discharge destination (%)					
Discharged to community	93.1	86.9	80.1	70.2	86.9
Remaining in hospital system	6.9	13.1	19.9	29.8	13.1
FIM improvement (Mean+95%CI)	13.3 (13.0–13.6)	19.5 (19.0–20.1)	24.1 (23.3–24.8)	18.7 (16.9–20.4)	17.9 (17.6–18.2)
FIM efficiency (FIM imp./LOS)	0.8	0.8	0.8	0.7	0.8

**Figure 11C Orthopaedic fractures discharge destination****Figure 11D Orthopaedic fractures LOS & FIM change by AN-SNAP class**

### Key changes since 2006

The key differences between the 2006 and 2007 data are presented in Figure 11E. The proportion of episodes provided by the private sector increased from 43.5% to 54.2%, and the average age of patients decreased slightly by 0.6 years. The average FIM on admission and discharge increased by 2.2 and 1.9 respectively, and the proportion of patients discharged into the community increased 3.6%.

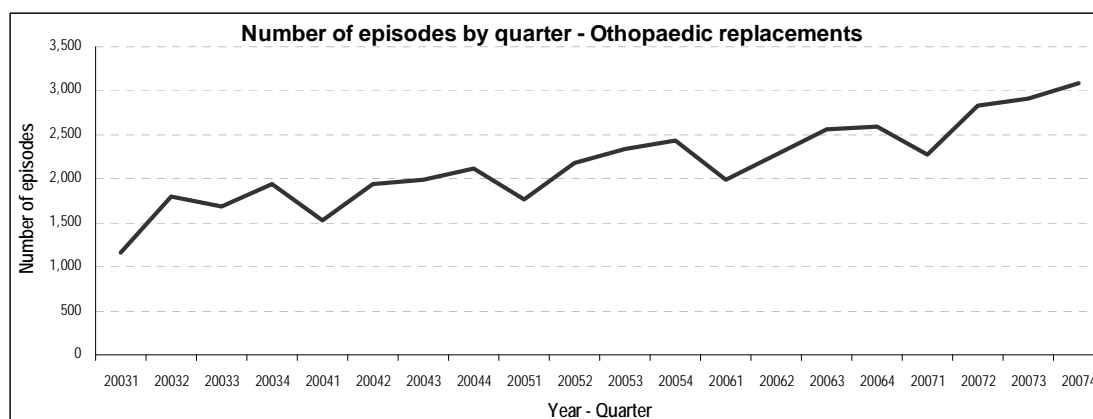
**Figure 11E Change in Outcome Measures in Orthopaedic Fractures - 2006 to 2007**



### 3.7.2 Orthopaedic: joint replacements

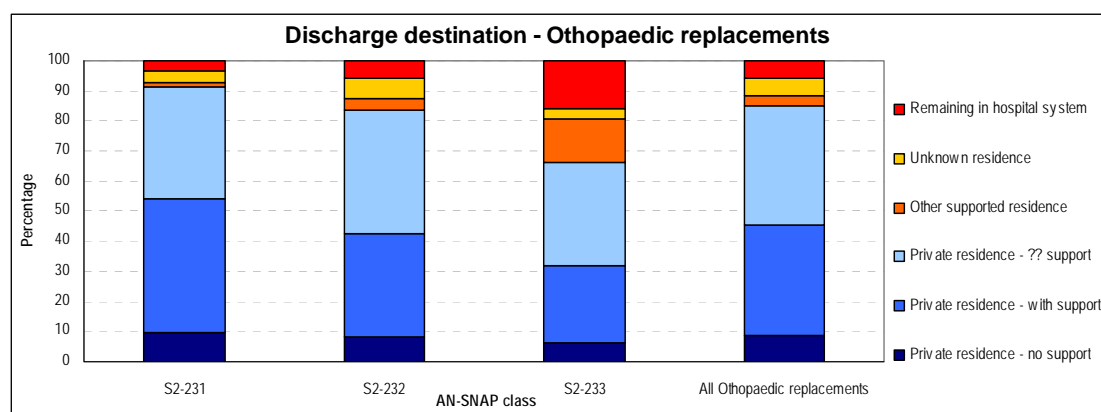
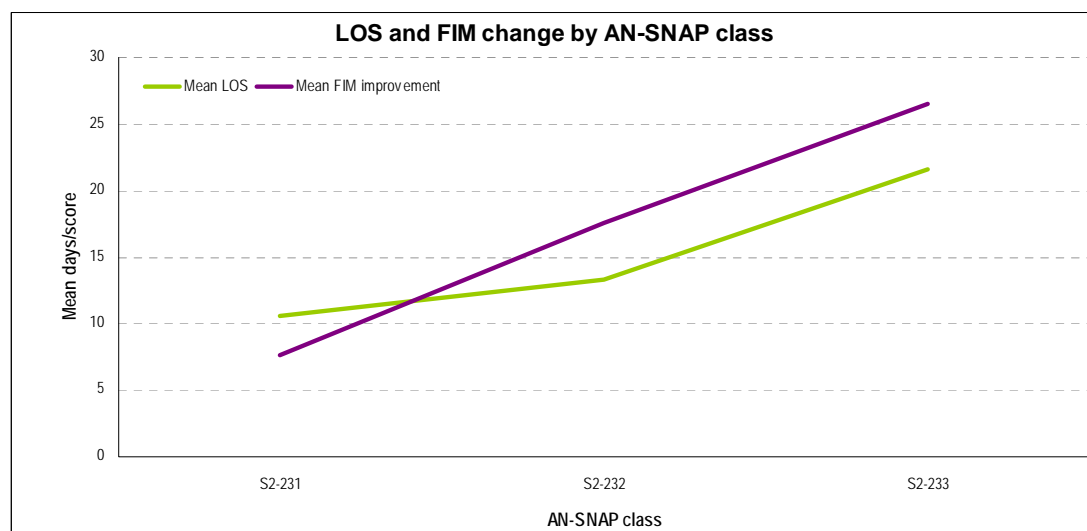
Consistent with orthopaedic fracture rehabilitation, the majority of episodes within this category were female (66.6%) and this pattern was evident across the three classes. The AN-SNAP class S2-232 accounted for 61.9% of all episodes, and the vast majority of episodes were provided by the private sector (84.9%). The average age of patients was 72.9 years, with patients in the most impaired class approximately 10 years older on average compared with the least impaired class. The average FIM on admission was 98.2, and ranged from 68.2 to 110.1 across the three classes. The ALOS was 13.0 days and ranged from 10.6 days for the least impaired class to 21.6 days for the most impaired class. The average FIM improvement was 15.0 and was greatest for the most impaired class, whilst FIM efficiency was lowest in the least impaired class. In total, 94.2% of patients were discharged into the community, but this figure was considerably lower in the most impaired class.

**Figure 12A Change in number of orthopaedic joint replacements over time (2003-2007)**



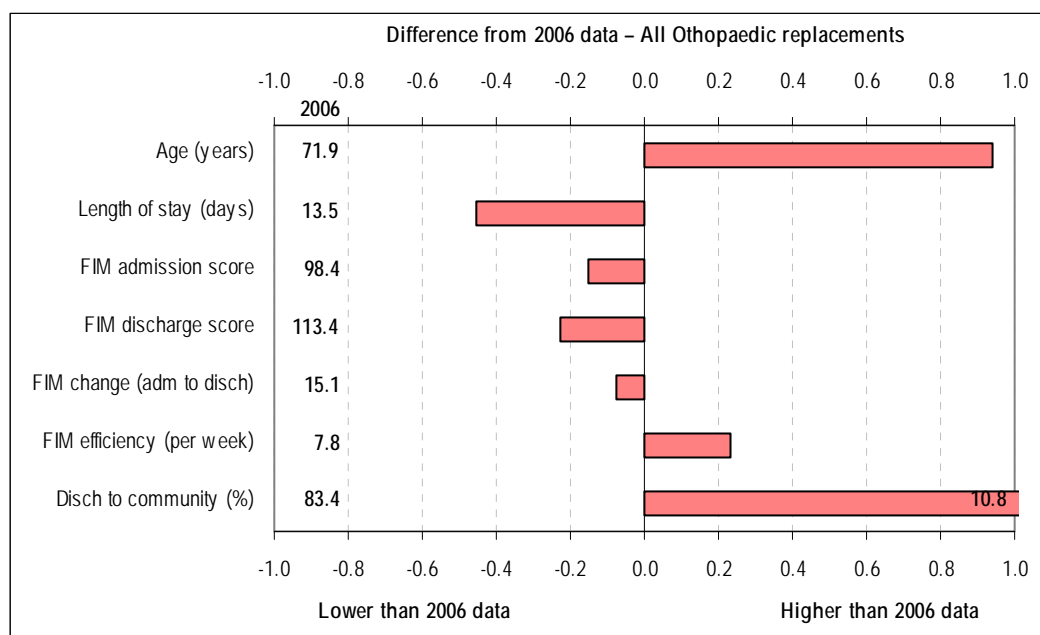
**Figure 12B Summary of orthopaedic joint replacements episodes in 2007**

AN-SNAP class:	S2-231	S2-232	S2-233	All Orthopaedic replacements
Number of episodes	3,504	6,827	702	11,033
Proportion of episodes	31.8%	61.9%	6.4%	100.0%
Sector (%)				
Private	89.2	84.7	65.7	84.9
Public	10.8	15.3	34.3	15.1
Gender (%)				
Female	61.0	69.4	67.8	66.6
Male	39.0	30.6	32.2	33.4
Age (Mean+95%CI)	69.4 (69.1–69.7)	74.1 (73.9–74.3)	78.0 (77.2–78.8)	72.9 (72.7–73.0)
Admission FIM (Mean+95%CI)	110.1 (110.0–110.3)	95.2 (95.0–95.4)	68.2 (67.4–69.1)	98.2 (98.0–98.5)
LOS (Mean+95%CI)	10.6 (10.4–10.8)	13.4 (13.2–13.5)	21.6 (20.5–22.7)	13.0 (12.9–13.1)
Discharge destination (%)				
Discharged to community	96.4	94.1	84.0	94.2
Remaining in hospital system	3.6	5.9	16.0	5.8
FIM improvement (Mean+95%CI)	7.7 (7.5–7.8)	17.6 (17.4–17.7)	26.5 (25.3–27.7)	15.0 (14.8–15.2)
FIM efficiency (FIM imp./LOS)	0.7	1.3	1.2	1.2

**Figure 12C Orthopaedic joint replacements discharge destination****Figure 12D Orthopaedic joint replacements LOS & FIM change by AN-SNAP class****Key changes since 2006**

The key differences between the 2006 and 2007 data are presented in Figure 12E. The average age of patients increased slightly by 0.9 years and the proportion of episodes provided by the private sector increased slightly from 79.5% to 84.9%. There was a 10.8% increase in the proportion of patients discharged into the community and a slight decrease in ALOS (0.5 days); there were no noticeable differences in FIM efficiency or improvement.

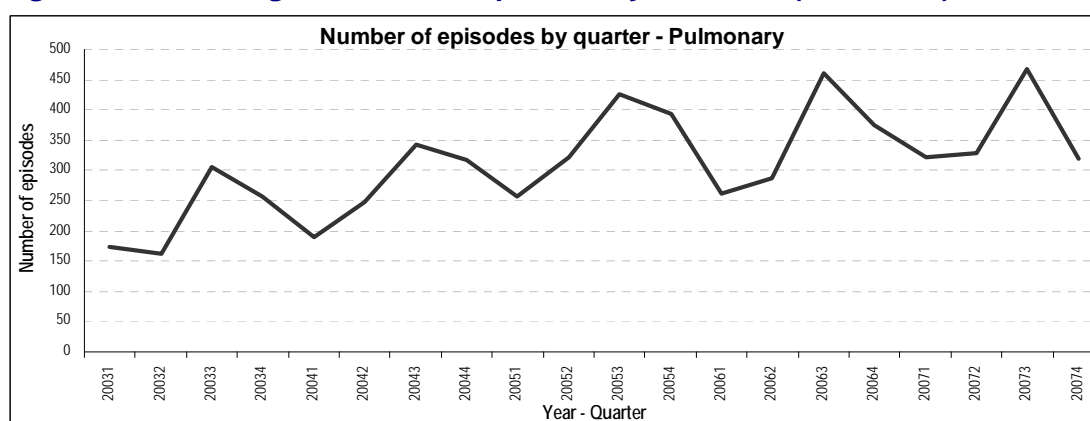
**Figure 12E Change in Outcome Measures in Orthopaedic Joint Replacements - 2006 to 2007**



### 3.8 Pulmonary

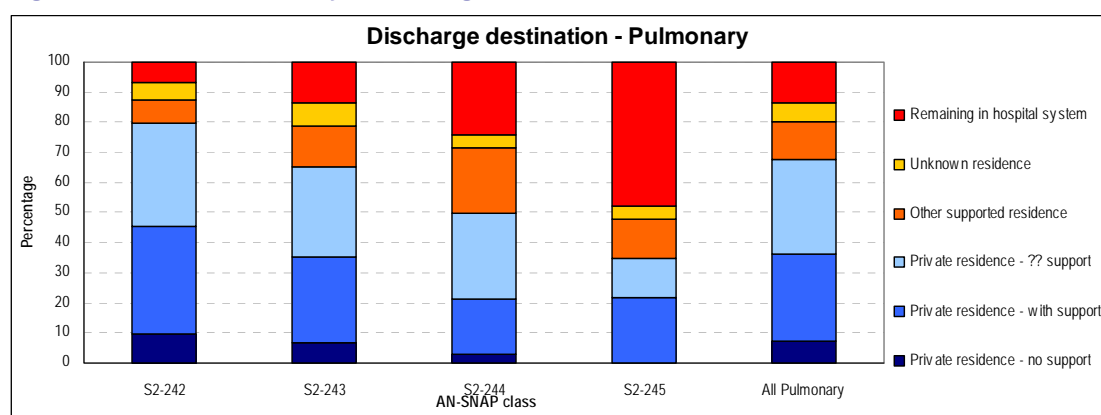
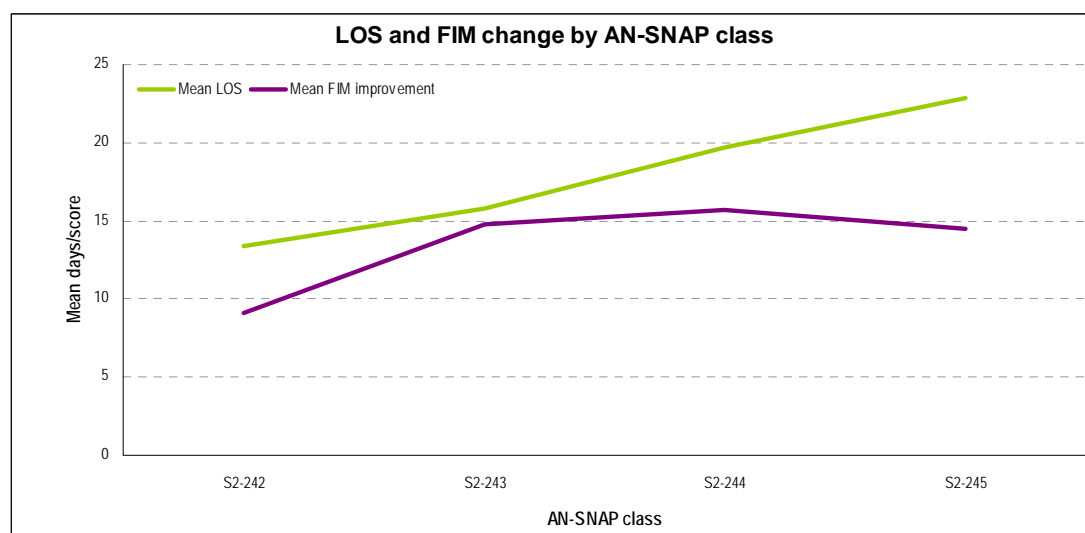
Figure 13A demonstrates consistent seasonal variation in pulmonary episodes over the past five years with a peak observed during the third quarter (winter). This could reflect the increased incidence of pulmonary medical conditions, particularly in older individuals, during the winter months. Overall the majority of pulmonary episodes were provided by the private sector (67.8%), but this was not the case for most impaired classes. The average age of patients was 79.6 years, and this was consistent across the four classes. The average FIM admission score was 92.2 and ranged from 44.1 to 107.3 across the four classes. FIM efficiency was greatest for the moderately impaired classes (S2-243 and S2-244). The majority of patients were discharged into the community (86.5%), but this declined with increasing functional impairment.

**Figure 13A Change in number of pulmonary over time (2003-2007)**



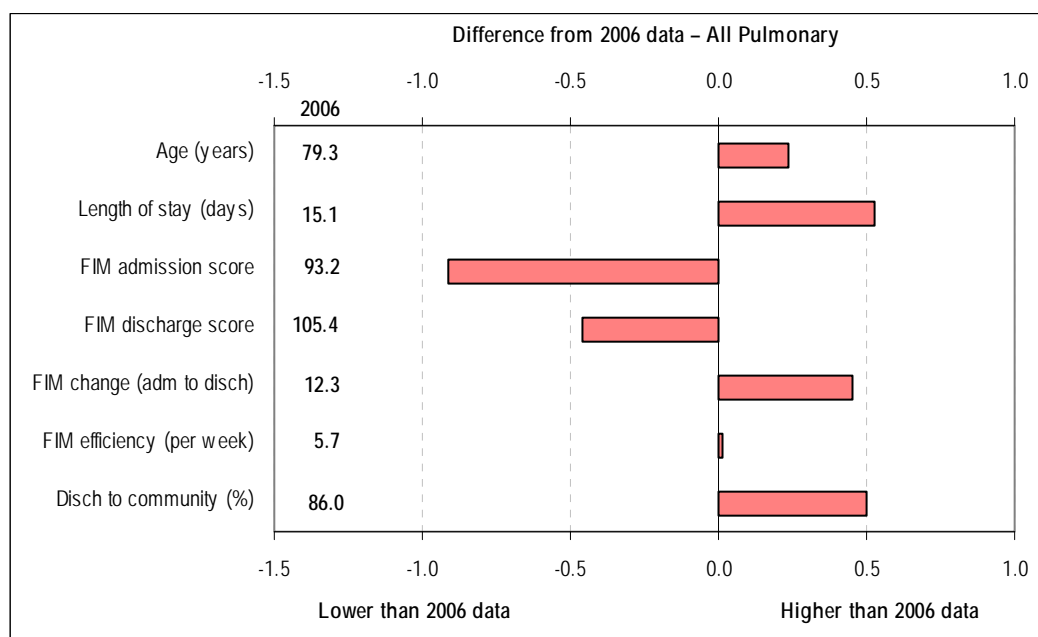
**Figure 13B Summary of pulmonary episodes in 2007**

AN-SNAP class:	S2-242	S2-243	S2-244	S2-245	All Pulmonary
Number of episodes	567	549	286	23	1,425
Proportion of episodes	39.8%	38.5%	20.1%	1.6%	100.0%
Sector (%)					
Private	75.5	71.2	50.0	17.4	67.8
Public	24.5	28.8	50.0	82.6	32.2
Gender (%)					
Female	54.2	56.8	47.6	34.8	53.5
Male	45.8	43.2	52.4	65.2	46.5
Age (Mean+95%CI)	77.4 (76.6–78.3)	81.1 (80.4–81.8)	80.8 (79.6–82.1)	79.4 (73.8–85.0)	79.6 (79.0–80.1)
Admission FIM (Mean+95%CI)	107.3 (106.7–107.9)	90.7 (90.1–91.2)	68.2 (66.9–69.4)	44.1 (38.5–49.6)	92.2 (91.3–93.2)
LOS (Mean+95%CI)	13.3 (12.7–14.0)	15.8 (15.0–16.6)	19.7 (18.2–21.3)	22.8 (15.0–30.6)	15.7 (15.1–16.2)
Discharge destination (%)					
Discharged to community	93.3	86.3	75.9	52.2	86.5
Remaining in hospital system	6.7	13.7	24.1	47.8	13.5
FIM improvement (Mean+95%CI)	9.1 (8.6–9.7)	14.8 (13.8–15.7)	15.8 (13.7–17.8)	14.5 (5.4–23.7)	12.7 (12.1–13.3)
FIM efficiency (FIM imp./LOS)	0.7	0.9	0.8	0.6	0.8

**Figure 13C Pulmonary discharge destination****Figure 13D Pulmonary LOS & FIM change by AN-SNAP class****Key changes since 2006**

The key differences between the 2006 and 2007 data are presented in Figure 13E. The average FIM admission and discharge scores decreased slightly by 0.9 and 0.5 respectively. There were no clear changes in FIM improvement, FIM efficiency or average age.

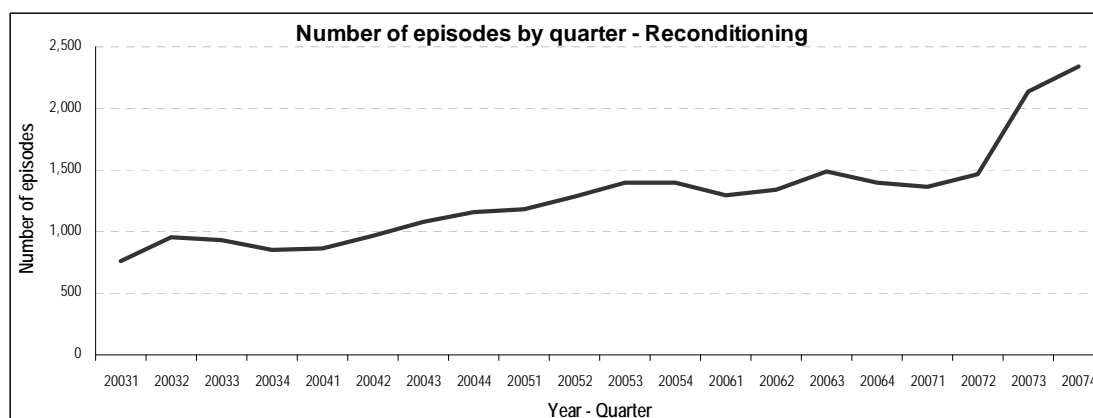
**Figure 13E Change in Outcome Measures in Pulmonary - 2006 to 2007**



### 3.9 Reconditioning

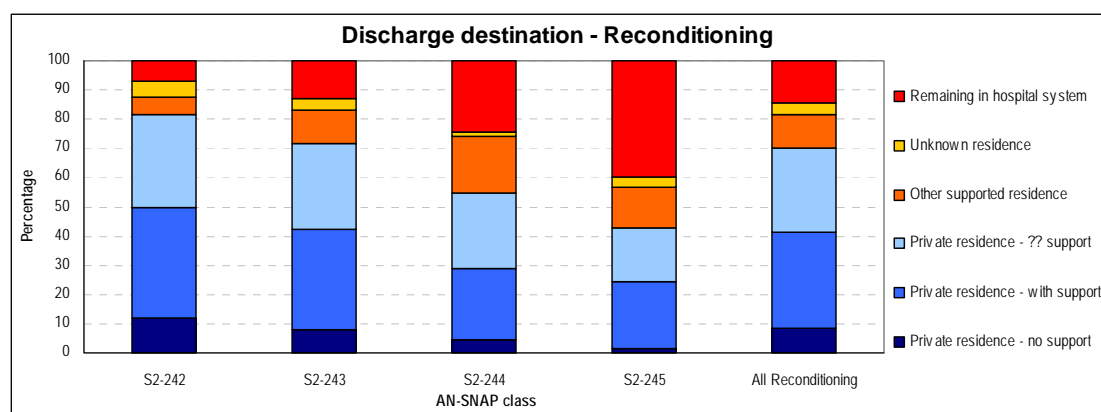
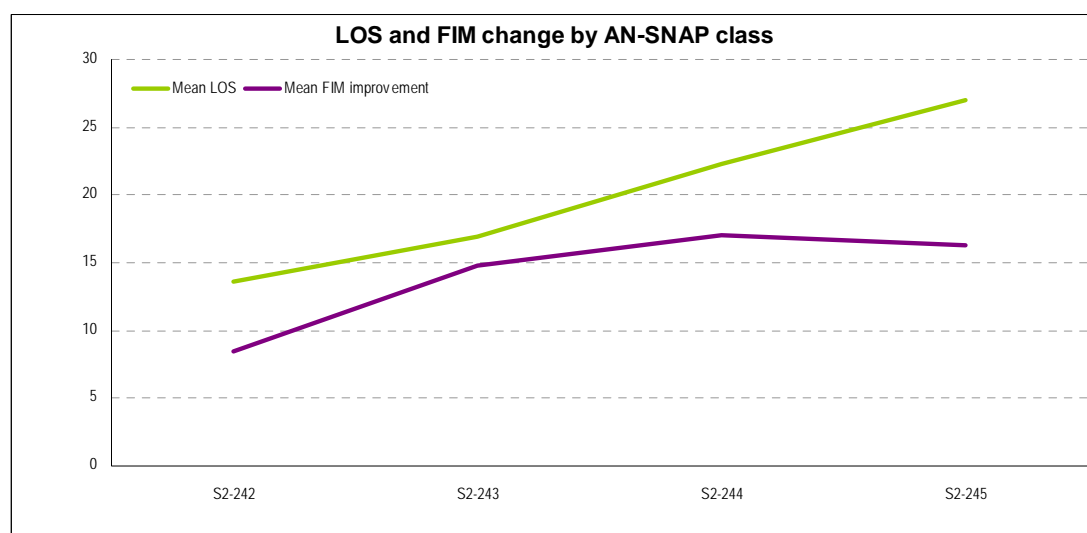
This impairment category was previously called debility. As part of the impairment code review described in the introduction, this impairment was renamed reconditioning; this better reflects the reason these type of patients are receiving rehabilitation. Following the implementation of the version 3 AROC dataset there has been a dramatic increase in the number of episodes reported as reconditioning, as shown in Figure 14A. The average age of patients in this category was 79.6 years, which was fairly consistent across the AN-SNAP classes. The majority of episodes were provided by the private sector (71.2%), however this proportion declined with impairment with class S2-245 having the majority of episodes provided by the public sector. The average FIM score was 89.0 and ranged from 41.2 to 106.4 across the four classes. The ALOS was 17.4 days and this ranged from 13.6 days for the least impaired class to 27.1 days for the most impaired class. There was also a trend for the most impaired classes to show the greatest FIM improvement, with FIM efficiency highest for the moderately impaired classes.

**Figure 14A Change in number of reconditioning over time (2003-2007)**



**Figure 14B Summary of reconditioning episodes in 2007**

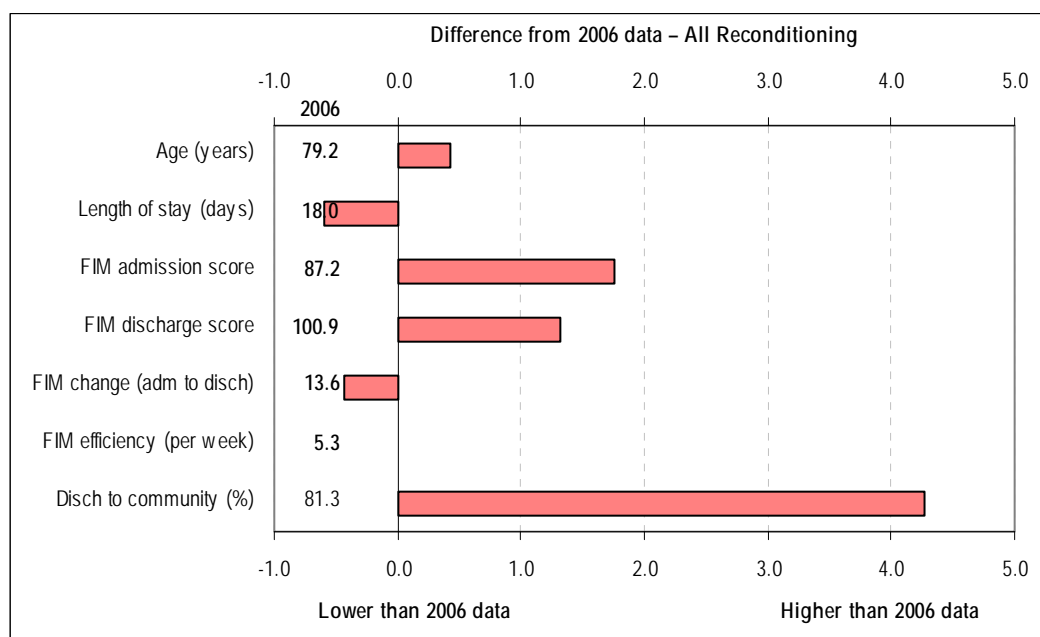
AN-SNAP class:	S2-242	S2-243	S2-244	S2-245	All Reconditioning
Number of episodes	2,504	2,682	1,848	185	7,219
Proportion of episodes	34.7%	37.2%	25.6%	2.6%	100.0%
Sector (%)					
Private	79.4	74.9	57.9	38.9	71.2
Public	20.6	25.1	42.1	61.1	28.8
Gender (%)					
Female	59.8	61.4	56.0	49.2	59.2
Male	40.2	38.6	44.0	50.8	40.8
Age (Mean+95%CI)	77.8 (77.4–78.3)	81.1 (80.7–81.4)	80.1 (79.5–80.6)	78.3 (76.4–80.3)	79.6 (79.4–79.9)
Admission FIM (Mean+95%CI)	106.4 (106.1–106.7)	89.7 (89.4–89.9)	68.6 (68.1–69.1)	41.2 (39.7–42.7)	89.0 (88.6–89.4)
LOS (Mean+95%CI)	13.6 (13.2–13.9)	17.0 (16.6–17.3)	22.3 (21.6–23.0)	27.1 (24.2–29.9)	17.4 (17.1–17.6)
Discharge destination (%)					
Discharged to community	92.9	87.0	75.9	60.0	85.5
Remaining in hospital system	7.1	13.0	24.1	40.0	14.5
FIM improvement (Mean+95%CI)	8.5 (8.2–8.8)	14.8 (14.4–15.2)	17.1 (16.3–17.8)	16.3 (13.2–19.4)	13.2 (12.9–13.5)
FIM efficiency (FIM imp./LOS)	0.6	0.9	0.8	0.6	0.8

**Figure 14C Reconditioning discharge destination****Figure 14D Reconditioning LOS & FIM change by AN-SNAP class**

### Key changes since 2006

The key differences between the 2006 and 2007 data are presented in Figure 14E. The average FIM admission and discharge scores increased by 1.8 and 1.3 respectively, and the ALOS decreased slightly by 0.6 days. Furthermore, the proportion of patients discharged to the community increased 4.3%.

**Figure 14E Change in Outcome Measures in Reconditioning - 2006 to 2007**

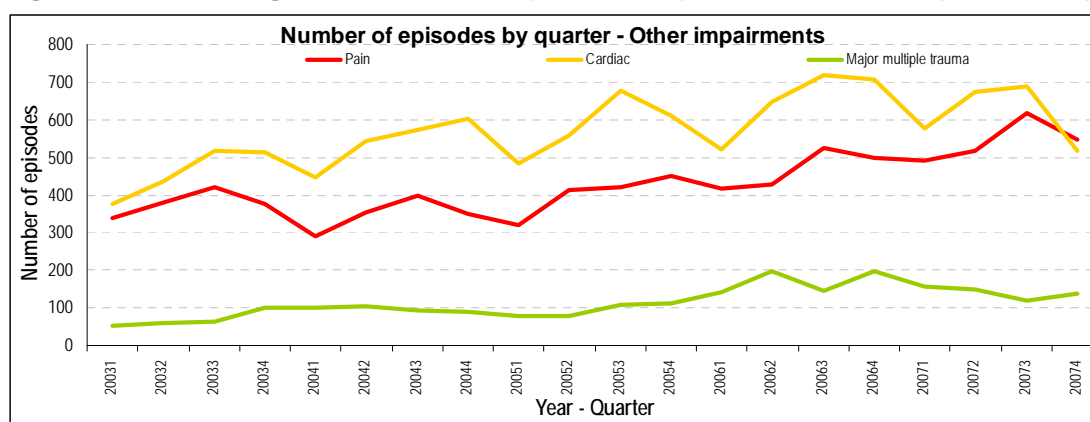


### 3.10 Pain, cardiac, major multiple trauma, burns, congenital deformities, and developmental disabilities

These six impairments are displayed together because of low episode volumes, collectively accounting for less than 10% of all episodes in 2007. The majority of pain, cardiac, major multiple trauma (MMT) and developmental disabilities episodes were provided by the private sector, whereas the public sector provided the majority of burns and congenital deformities episodes. Females accounted for the majority of pain, congenital deformities and developmental disabilities episodes, whereas males accounted for the majority of MMT and burns episodes. The average age of MMT, burns and congenital deformities patients (range 43.5 – 56.6 years) was considerably lower compared to pain, cardiac and developmental disabilities patients (range 73.1 – 78.7 years).

All of the classes had a similar rate of discharge to the community (range 85.9% to 90.9%), with the exception of burns episodes, where the rate of discharge to the community was lower at 65.6%. FIM efficiency was lowest for the burns and congenital deformity classes.

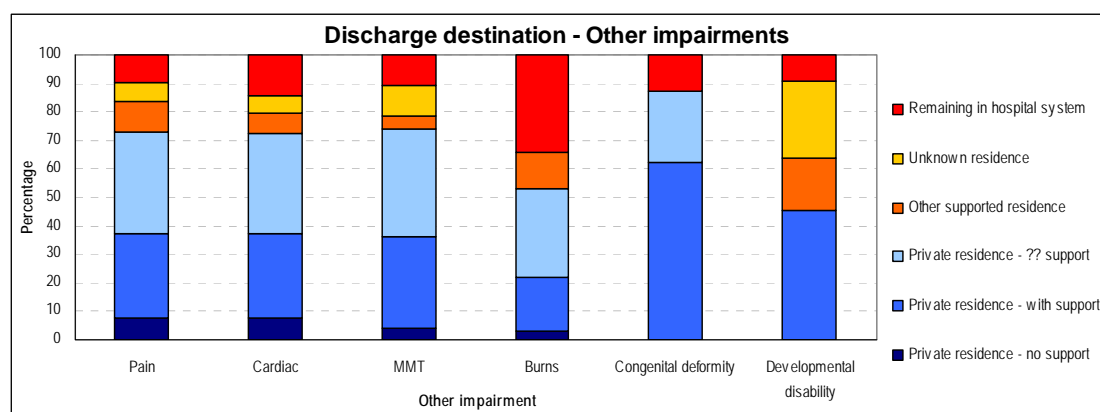
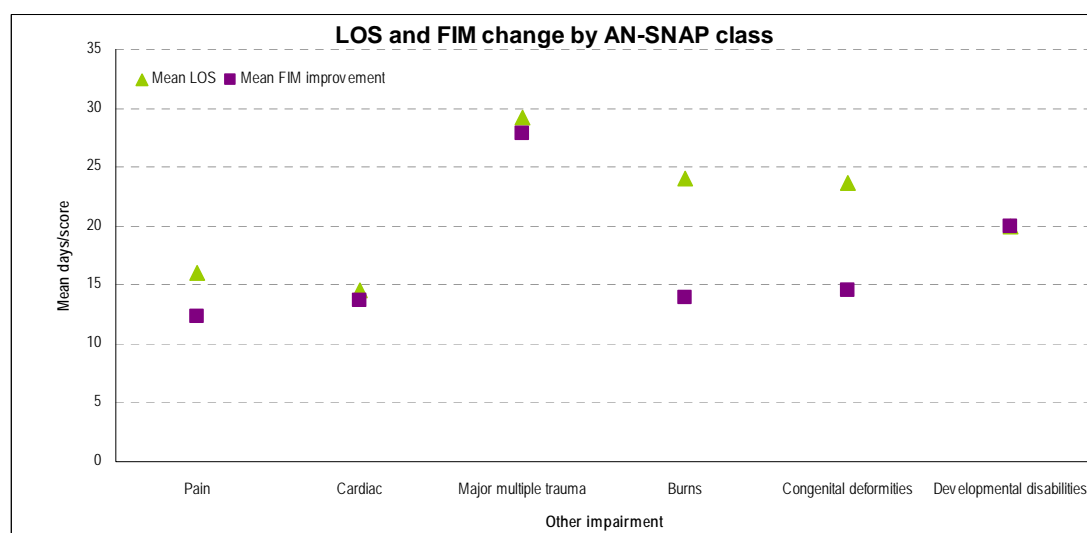
**Figure 15A Change in number of impairment episodes over time (2003-2007)**





**Figure 15B Summary of impairment episodes in 2007**

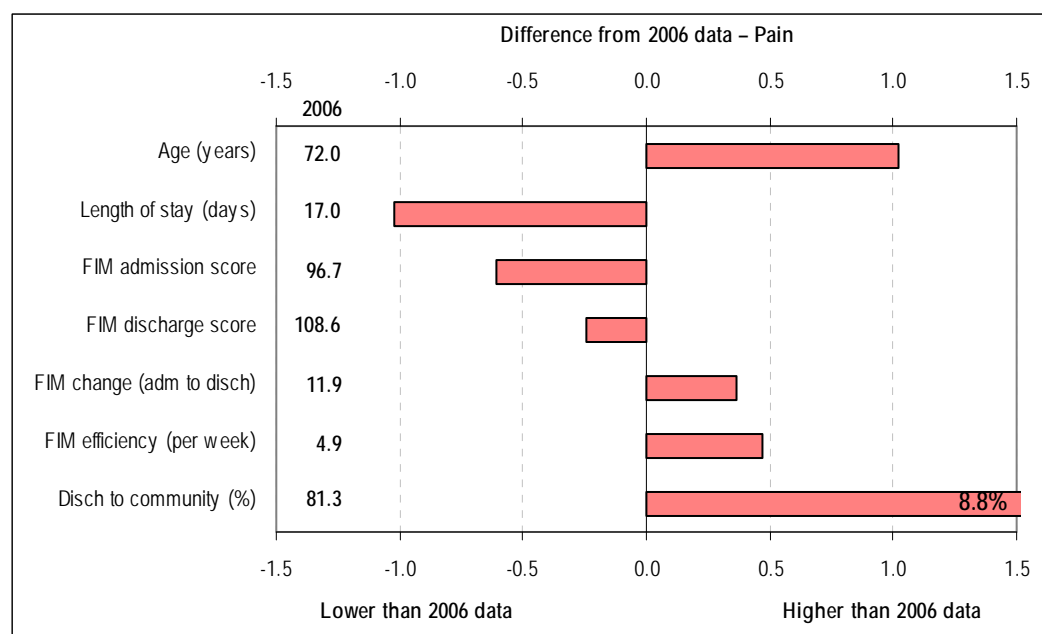
	Pain	Cardiac	MMT	Burns	Congenital defomental disability	
Number of episodes	2,132	2,437	500	32	8	11
Proportion of total episodes in 2007	4.2%	4.8%	1.0%	0.1%	0.0%	0.0%
Sector (%)						
Private	72.2	77.8	79.1	31.3	37.5	81.8
Public	27.8	22.2	20.9	68.8	62.5	18.2
Gender (%)						
Female	70.9	49.2	34.2	28.1	87.5	63.6
Male	29.1	50.8	65.8	71.9	12.5	36.4
Age (Mean+95%CI)	73.1 (72.4–73.8)	78.7 (78.3–79.1)	43.5 (41.7–45.3)	55.9 (48.4–63.4)	56.6 (35.8–77.4)	75.5 (68.0–83.1)
Admission FIM (Mean+95%CI)	96.1 (95.4–96.9)	95.8 (95.1–96.4)	82.8 (80.8–84.7)	85.8 (77.8–93.8)	83.4 (69.4–97.3)	80.6 (67.0–94.2)
LOS (Mean+95%CI)	16.0 (15.5–16.4)	14.6 (14.2–14.9)	29.2 (27.3–31.2)	24.0 (17.2–30.8)	23.6 (10.7–36.6)	20.0 (14.1–25.9)
Discharge destination (%)						
Discharged to community	90.2	85.9	89.4	65.6	87.5	90.9
Remaining in hospital system	9.8	14.1	10.6	34.4	12.5	9.1
FIM improvement (Mean+95%CI)	12.3 (11.8–12.7)	13.7 (13.2–14.2)	27.8 (26.0–29.6)	13.9 (9.0–18.7)	14.5 (3.6–25.4)	19.9 (8.9–30.9)
FIM efficiency (FIM imp./LOS)	0.8	0.9	1.0	0.6	0.6	1.0

**Figure 15C Impairment discharge destination****Figure 15D Impairment LOS & FIM change by AN-SNAP class****Key changes since 2006**

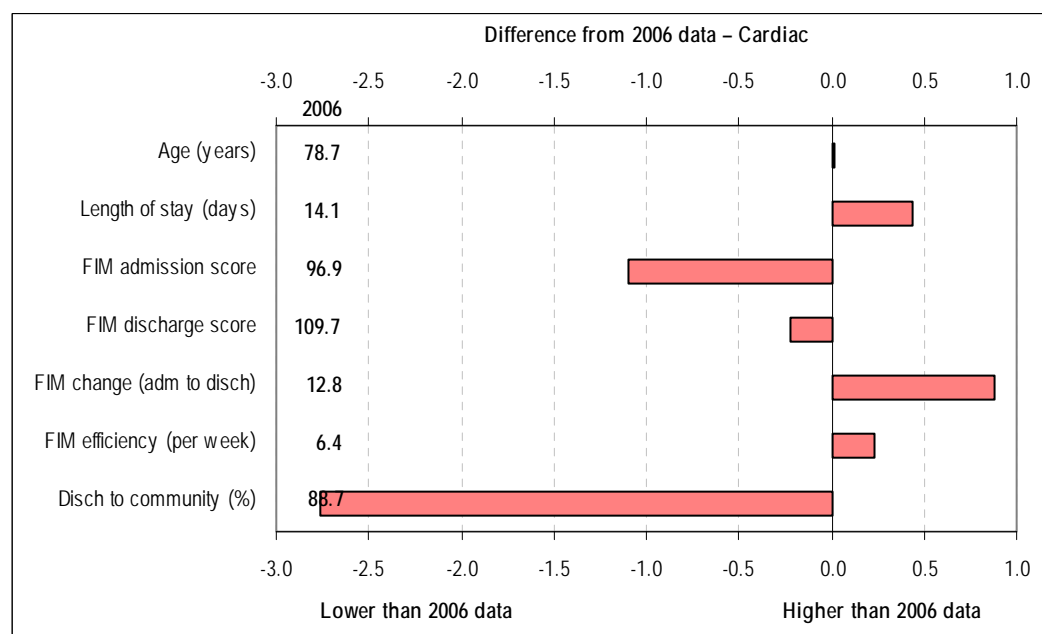
The key differences between the 2006 and 2007 data are presented in Figure 15E. Given the low volumes for burns, congenital deformity and developmental disability episodes, only changes in pain, cardiac and MMT between 2006 and 2007 are presented and discussed. For the pain category, the average age of patients increased by 1.0 years, ALOS declined by 1 day and the proportion of patients discharged to the community increased 8.8%. For the cardiac category, FIM scores on admission decreased 1.1, FIM improvement increased 0.9, and there was a 2.8% decrease in the proportion of patients discharged to the community. For MMT the ALOS decreased by 2.3 days and the proportion of patients discharged into the community increased

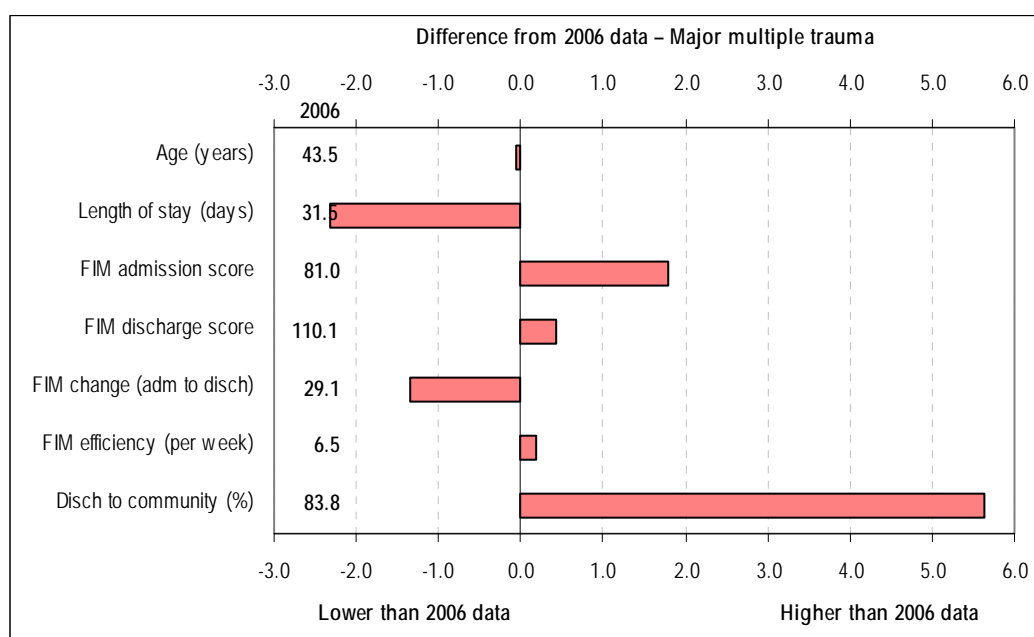
5.6%. The proportion of episodes provided by the private sector increased sharply from 44.7% to 79.1%. Furthermore, FIM scores on admission increased by 1.8 and FIM improvement decreased by 1.4.

**Figure 15E Change in Outcome Measures in Pain - 2006 to 2007**



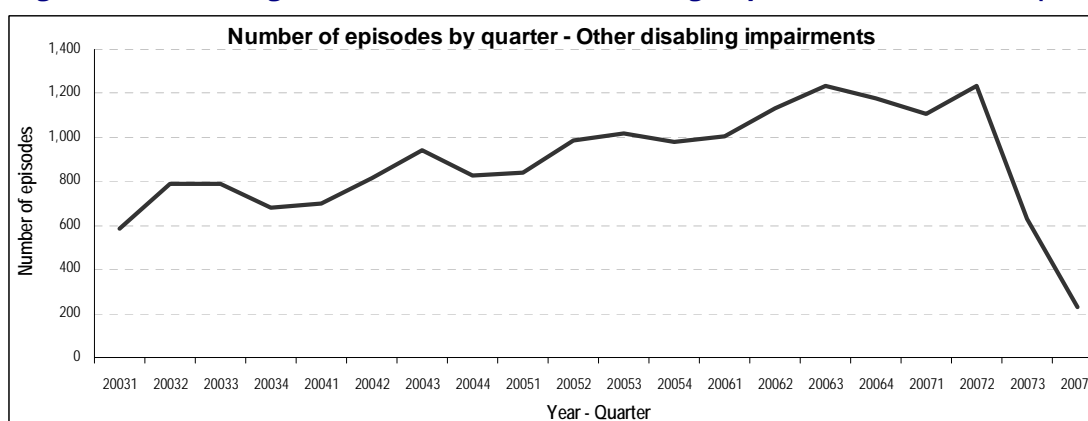
**Figure 15F Change in Outcome Measures in Cardiac - 2006 to 2007**



**Figure 15G Change in Outcome Measures in Major Multiple Trauma - 2006 to 2007**

### 3.11 Other Disabling Impairments

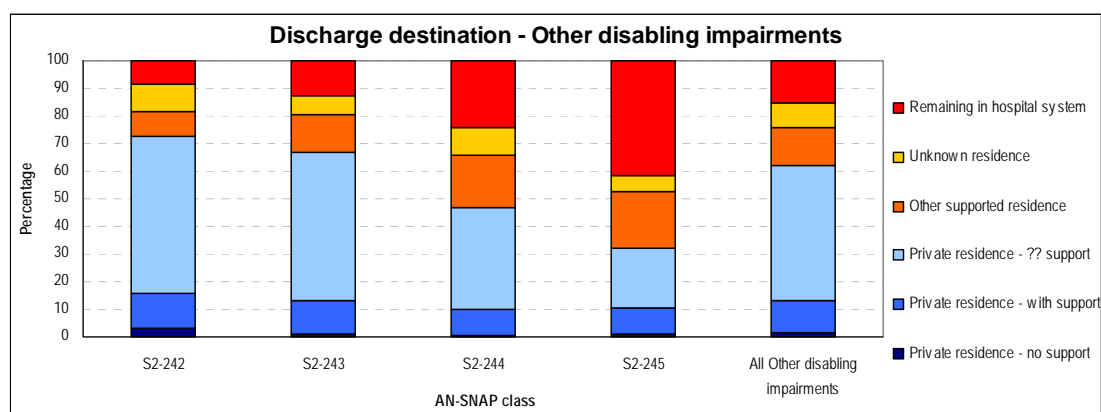
Following the implementation of the version 3 AROC dataset there has been a dramatic drop in the number of episodes being reported in this impairment category as shown in Figure 16.A. The majority of these episodes were female (61.4%) and the average age of was 77.6 years; these figures were fairly consistent across the four classes. The average FIM admission score was 88.0 and ranged from 45.9 to 98.4 across the different classes. The ALOS was 18.4 days and ranged from 14.4 days for the least impaired group to 29.0 days for the most impaired group. The average FIM improvement was 13.6 and was greatest for the most impaired class, although FIM efficiency was greatest for the moderately impaired classes. In total, 84.6% of patients were discharged to the community, with patients from the most impaired class less likely to be discharged to the community.

**Figure 16A Change in number of other disabling impairments over time (2003-2007)**

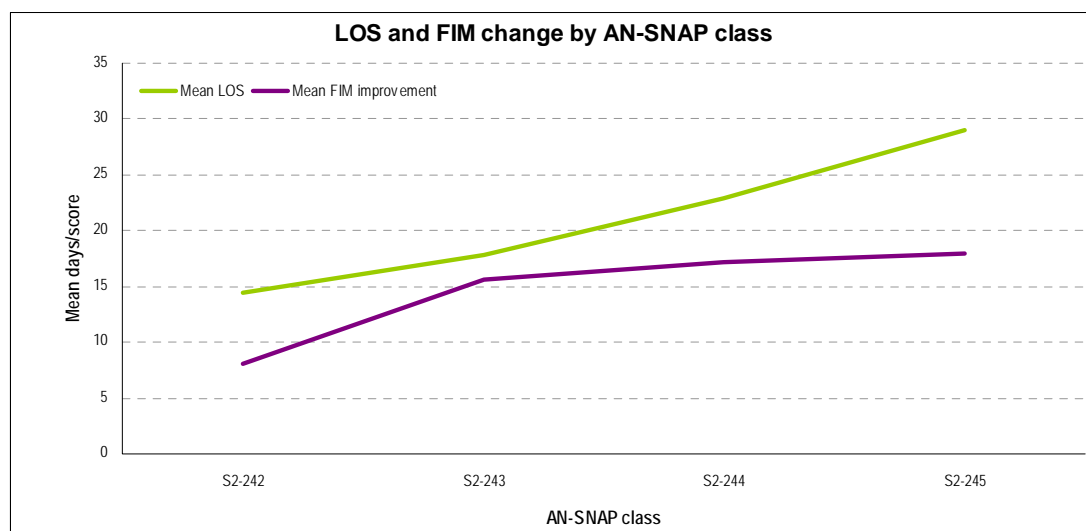
**Figure 16B Summary of other disabling impairments in 2007**

AN-SNAP class:	S2-242	S2-243	S2-244	S2-245	All Other disabling impairments
Number of episodes	1,027	1,145	916	87	3,175
Proportion of episodes	32.3%	36.1%	28.9%	2.7%	100.0%
Sector (%)					
Private	60.8	57.4	39.2	17.2	52.1
Public	39.2	42.6	60.8	82.8	47.9
Gender (%)					
Female	62.0	63.0	59.0	58.6	61.4
Male	38.0	37.0	41.0	41.4	38.6
Age (Mean+95%CI)	74.9 (74.0–75.7)	79.3 (78.6–79.9)	79.2 (78.4–79.9)	72.3 (68.7–76.0)	77.6 (77.2–78.1)
Admission FIM (Mean+95%CI)	98.4 (98.1–98.7)	82.1 (81.8–82.4)	66.6 (66.2–67.1)	45.9 (44.8–46.9)	88.0 (87.3–88.6)
LOS (Mean+95%CI)	14.4 (13.9–14.9)	17.8 (17.2–18.5)	22.9 (21.9–23.9)	29.0 (24.3–33.7)	18.4 (18.0–18.9)
Discharge destination (%)					
Discharged to community	91.5	87.4	75.9	58.6	84.6
Remaining in hospital system	8.5	12.6	24.1	41.4	15.4
FIM improvement (Mean+95%CI)	8.1 (7.5–8.6)	15.6 (14.9–16.2)	17.1 (16.0–18.3)	17.9 (13.1–22.7)	13.6 (13.2–14.1)
FIM efficiency (FIM imp./LOS)	0.6	0.9	0.7	0.6	0.7

**Figure 16C Other disabling impairments discharge destination**

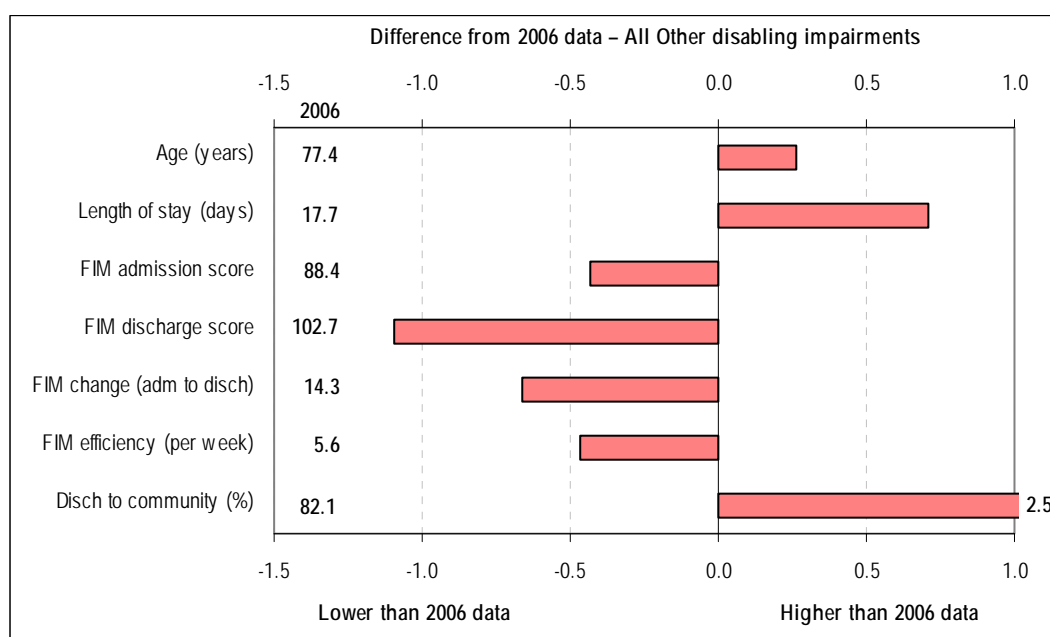


**Figure 16D Other disabling impairments LOS & FIM change by AN-SNAP class**



### Key changes since 2006

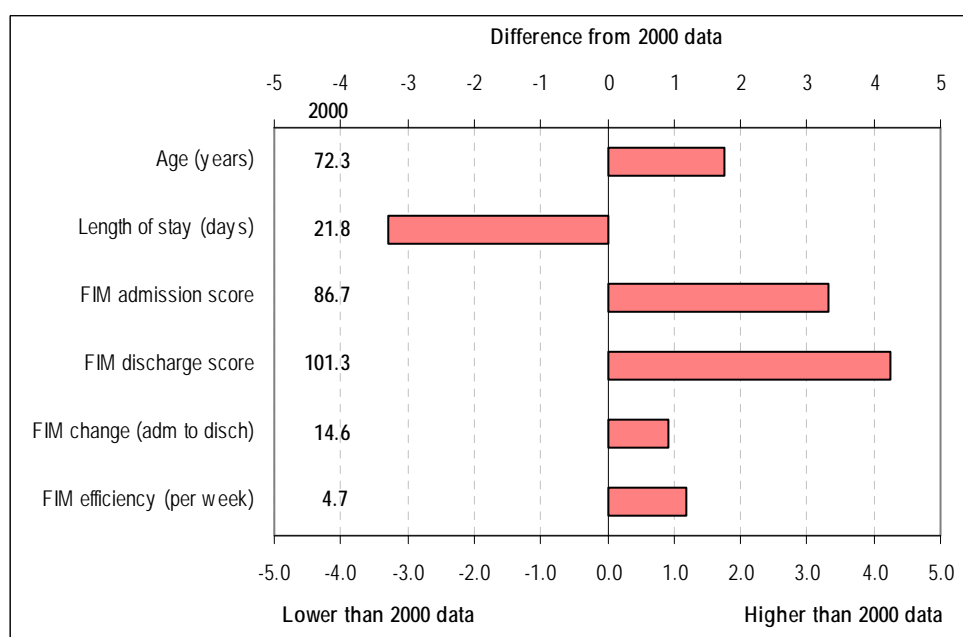
The key differences between the 2006 and 2007 data are presented in Figure 16E. LOS increased slightly (0.7 days) while FIM scores at discharge decreased by 1.1 and FIM improvement also decreased slightly by 0.7. The proportion of patients discharged to the community increased 2.5%. These changes should be treated with caution due to the huge drop in episodes now being reported in this category.

**Figure 15E** *Change in Outcome Measures in Other Disabling Impairments - 2006 to 2007*

## 4 Changes in Rehabilitation

In the two previous AROC annual reports, we have commented on changes in rehabilitation outcomes across all impairment categories since 2000. Therefore, in this report, we comment on changes in rehabilitation outcomes between 2000 and 2007, as well as the major changes observed between 2006 and 2007.

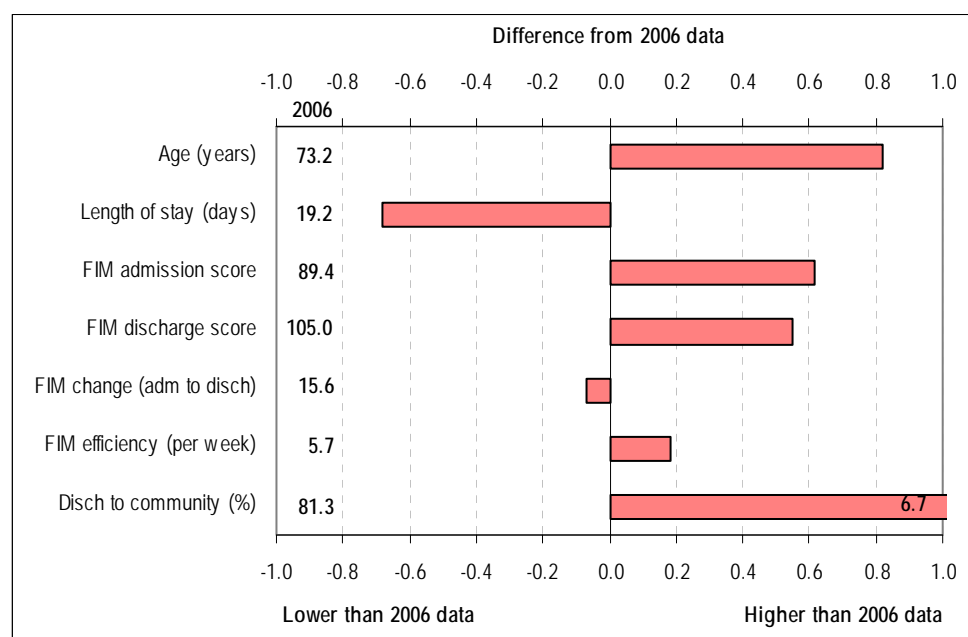
Figure 17 presents the overall changes in rehabilitation outcomes between 2000 and 2007. The number of episodes increased by 50% and the average age of patients has increased 1.8 years to 74.0 years. Furthermore, there is also evidence of an improvement in the main rehabilitation outcomes during this period. For example, FIM efficiency and FIM improvement have both increased, whilst the ALOS has fallen by 3.3 days. Furthermore, the increase in the average FIM discharge score suggests that patients have more functional capacity when discharged compared

**Figure 17** *Changes over time in rehabilitation in Australia, 2000–2007*

to previous years. Therefore, it is not surprising that the proportion of patients discharged into the community has increased 3.3%.

Figure 18 presents data on changes in rehabilitation outcomes between 2006 and 2007, which are largely consistent with the changes observed between 2000 and 2007. For example, the average age of patients increased by 0.8 years, and FIM admission and discharge scores also increased slightly. The ALOS decreased by 0.7 days and the proportion of patients discharged into the community increased 6.7%. However, in contrast to previous years, the number of episodes decreased slightly by 2.1%.

**Figure 18** *Changes over time in rehabilitation in Australia, 2006–2007*

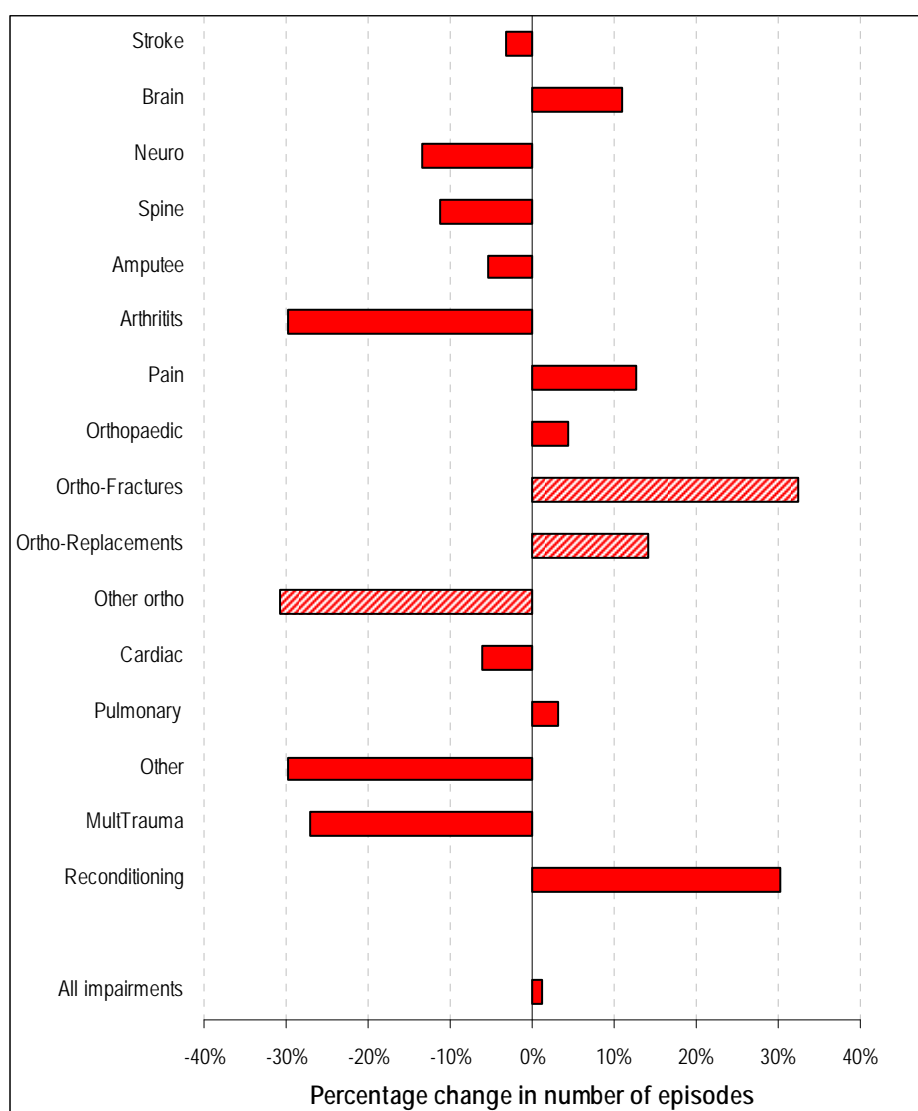


Finally, Figure 19 presents data on the changes in the number of episodes by each impairment group between 2006 and 2007. Importantly, these data have been adjusted for the number of facilities submitting to AROC and hence provide an accurate indication of real growth over the past year. Leaving aside the changes to the volume of orthopaedic impairment categories which is due to the review of the other orthopaedic category and the subsequent improvement in coding of these episodes, the most striking changes are the 30% increases in reconditioning and 30% reductions in each of arthritis, MMT and other disabling impairment episodes. Some of these changes may be a direct result of improved coding in the version 3 AROC dataset. The point to note is that unlike 2006, in 2007 the overall volume of rehabilitation episodes was only 1.3% (2006 overall growth 9.6%).

## 5 Discussion

The 2007 AROC database describes rehabilitation data that are consistent with previous years. For example, the majority of episodes are female and aged over 70 years, and most episodes are provided by the private sector. Furthermore, the majority of episodes fell into the least impaired classes. There was also a trend for the most impaired classes to have longer LOS and show the greatest FIM improvement. The majority of episodes were discharged into the community, but the proportion declines with increasing functional impairment.

Overall, episodes have fallen slightly (2.1%), with growth areas in the impairment groups brain, pain, pulmonary and reconditioning. Reconditioning impairments is the stand-out group for growth with a 30.2% increase.

**Figure 19** *Change in number of episodes by impairment group between 2006 and 2007*

The data also indicate a continuing trend for an improvement in rehabilitation outcome measures. For example, FIM improvement has continued to increase, whilst ALOS has decreased. Furthermore, there has been a gradual increase in the proportion of episodes discharged into the community.

With more clients discharged back to the community earlier there is a recognised need for more flexible ways of delivering rehabilitative focussed care in the community. The current AROC dataset collects information about inpatient rehabilitation episodes. Reflecting the increased emphasis on ambulatory rehabilitation, AROC developed an Ambulatory data set during 2006, and undertook a trial data collection utilising this draft data set in 2007. Data collection utilising version 1 of the AROC ambulatory data set will commence on January 1 2009. The first year results will be included in the 2009 data reporting and will provide a better understanding of the factors influencing outcomes and cost in the ambulatory sector.

Rehabilitation will continue as an increasingly important part of the continuum of healthcare as the population ages and as governments look for more efficient ways to deliver health, disability and aged care services. In association with AFRM, during 2007 AROC has been active in lobbying for the development of a national rehabilitation strategy to ensure that rehabilitation services across the country will be adequate into the future and will be able to make a contribution to the broader national health agenda.

The five elements required for a national rehabilitation strategy are:

- national leadership to place rehabilitation firmly on the national health agenda;
- national information about rehabilitation;
- better integration between acute care, rehabilitation, community care, primary care and disability services;
- national workforce planning; and
- national service planning standards.

### **Acknowledgement**

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AROC would like to thank all the staff from the rehabilitation facilities who have spent a great deal of time and care in scoring the FIM, and collecting, correcting or collating the AROC data, and without whose considerable efforts this paper would not be possible.